MZ-R30

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model
Australian Model
Tourist Model

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MT-MZR30-124
Optical Pick-up Type	KMS-250A/J2N

SPECIFICATIONS

System
Audio playing system
MiniDisc digital audio system
Laser diode properties
Material: GaAlAs
Wavelength: l = 780 nm
Emission duration: continuous
Laser output: less than 44.6 µW
(This output is the value measured at a distance of 200 mm from the lens surface on the optical pick-up block.)
Recording and playback time
Maximum 74 minutes (MDW-74, stereo recording)
Maximum 148 minutes (MDW-74, monaural recording)
Revolutions
400 rpm to 900 rpm (CLV)
Error correction
Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency
44.1 kHz
Sampling rate converter
Input: 33 kHz/44.1 kHz/48 kHz

Coding
Adaptive TRansform Acoustic Coding (ATRAC)
Modulation system
EFM (Eight to Fourteen Modulation)
Number of channels
2 stereo channels
1 monaural channel
Frequency response
20 to 20,000 Hz ± 3 dB
Wow and Flutter
Below measurable limit
Inputs
Microphone: stereo mini-jack, 0.22 – 0.78 mV
Line in: stereo mini-jack, 69 – 194 mV
Optical (Digital) in: optical (digital) mini-jack
Outputs
Headphones: stereo mini-jack, maximum output level 5 mW+ 5 mW, load impedance 16 ohm
Line out: stereo mini-jack, 194 mV, load impedance 10 kilohm

— Continued on page 2 —

PORTABLE MINIDISC RECORDER

SONY®

General

Power requirements
Sony AC power Adaptor (supplied) connected at the DC IN 6 V jack :
120V AC, 60 Hz (US, Canadian model)
230 – 240V AC, 50/60 Hz (UK model)
240V AC, 50/60 Hz (Australian model)
220 – 230V AC, 50/60 Hz (AEP model)
100 – 240V AC, 50/60 Hz (E, Tourist model)
Lithium ion rechargeable battery LIP-12(H) (supplied)
Two LR6 (size AA) alkaline batteries (not supplied)
Battery operation time
See "Battery life" (page 25)
Dimensions
Approx. 116.5× 26 × 78 mm (w/h/d)
(4 5/8 × 1 1/16 × 3 1/8 in.)
Mass
Approx. 220 g (7.1 oz) the recorder only
Approx. 317 g (10.2 oz) incl. a recordable MD, remote controller, and LIP-12 lithium ion rechargeable battery
Supplied accessories
AC power adaptor (1)
Headphones with a remote controller (1)
LIP-12 lithium ion rechargeable battery (1)
Ear pads (2)
Carrying pouch (1)
Dry battery case (1)

Design and specifications are subject to change without notice.

For customers in Europe

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This MiniDisc Recorder is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the buttom exterior.

IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

"MD WALKMAN" is a trademark of Sony Corporation.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

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SAFETY-RELATED COMPONENT WARNING!!

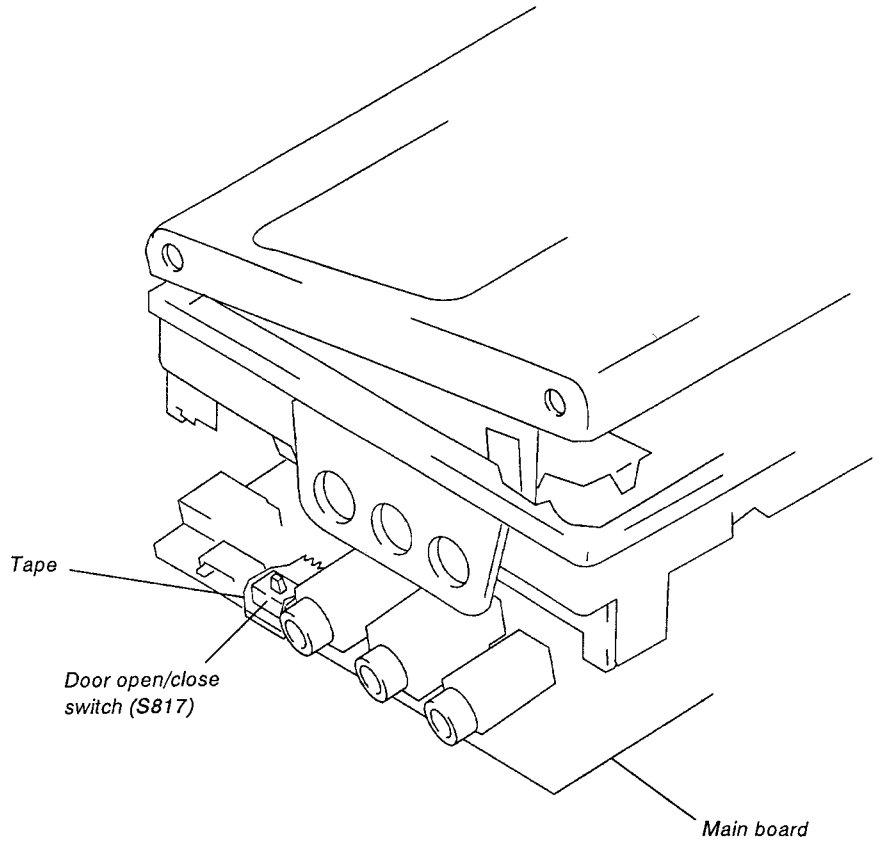
**COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION.
REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.**

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1
SERVICING NOTE

When repairing this device with the power on, if you remove the main board or open the upper panel assembly, this device stops working. In this case, you can work without the device stopping by fastening the hook of the Open/Close detection switch (S817) with tape.

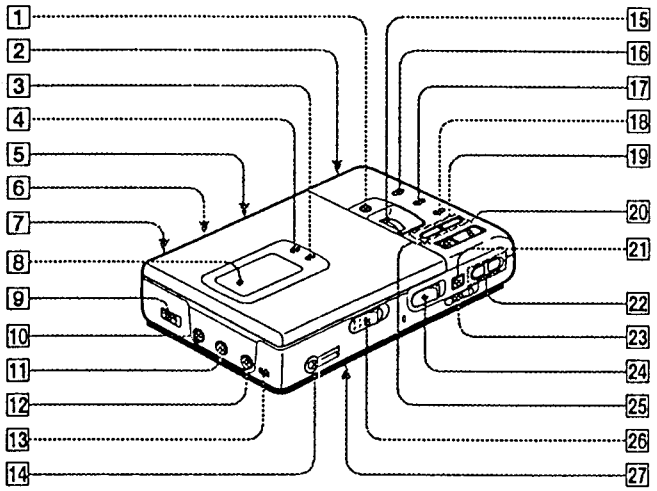


This section is extracted from instruction manual.

Looking at the controls

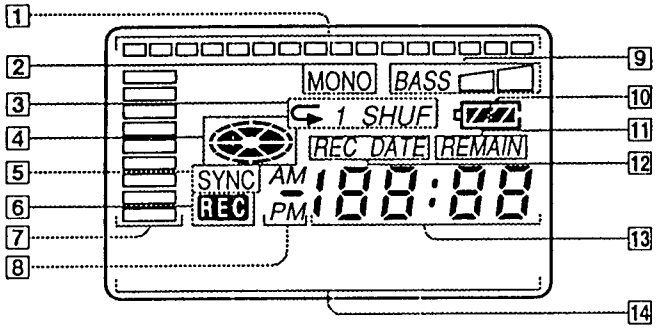
See pages in ( ) for more details.

The recorder

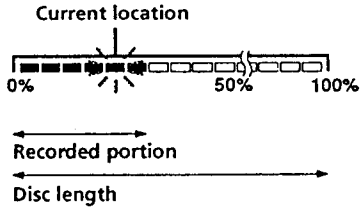


1 TITLE/ENTER button(22)
2 Battery compartment (on the bottom) (24)
3 MODE button (16)
4 DISPLAY button (14, 18)
5 MIC SENS switch (on the bottom) (12)
6 AVLS switch (on the bottom) (17)
7 DC IN 6V jack (at the rear) (6)
8 Display window (14,18)
9 SYNCHRO REC (synchro-recording) switch (11)
10 MIC (PLUG IN POWER) jack (12)
11 LINE IN (OPTICAL) jack (6, 11)
12 LINE OUT jack (19)
13 DIGITAL MEGA BASS button (17)
14 ∩ (headphones)/REMOTE jack (8)
15 Vertical jog dial (16)
16 TRACK MARK button (21)
17 END SEARCH button (7)
18 ERASE button (20)
19 ⏮/⏭ (search / AMS) button (7, 9)
20 ▶ (play) button (7, 9)
21 ⏸ (pause) button (7, 9)
22 VOLUME +/– button (9)
23 HOLD switch (18)
24 REC (record) switch (7)
25 ■ (stop) button (7, 9)
26 OPEN button (6)
27 CLOCK SET button (on the bottom) (15)

The display window

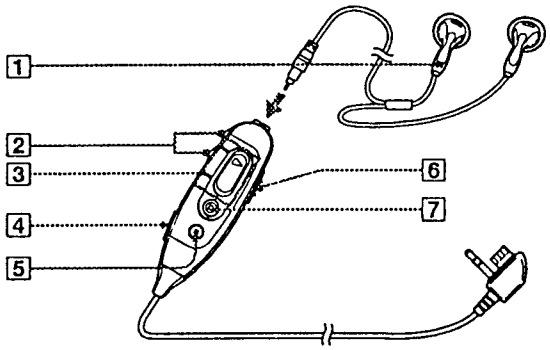


1 Position indicator (14, 18)
Shows the current location on the MD. The point under recording or playing flashes. The recorded portion lights up.



2 MONO (monaural) indication
3 Play mode indication
Shows the play mode of the MD.
4 Disc indication
Shows that the disc is rotating for recording, playing or editing an MD.
5 SYNC (synchro-recording) indication
6 REC indication (7)
Lights up while recording. When flashing, the recorder is in record standby mode.
7 Level meter
Shows the volume of the MD being played or recorded.
8 AM/PM indication (15)
Lights up along with the time indication in the 12-hour system.
9 Mega bass indication (17)
10 Battery indication (24)
Shows battery condition.
11 REMAIN (remaining time/tracks) indication (14,18)
Lights up along with the remaining time of the track, the remaining time of the MD, or the remaining number of tracks.
12 REC DATE (recorded/current date) indication
Lights up along with the date and time the MD was recorded. When only "DATE" lights up, the current date and time are displayed.
13 Time display (15)
Shows the recorded time, current time, elapsed time of the track or MD being recorded or played.
14 Character information display (14,18)
Displays the disc and track names, date, error messages, track numbers, etc.

The headphones with a remote controller



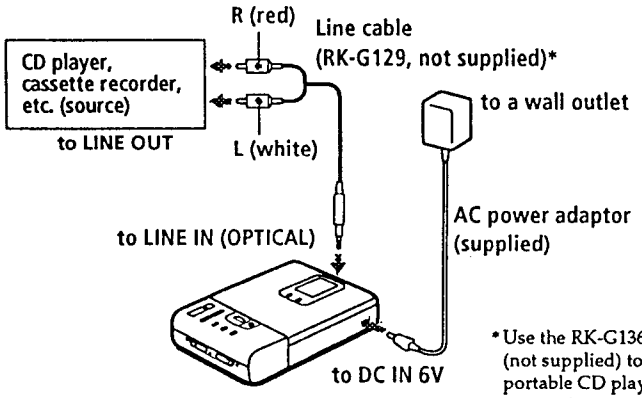
1 Headphones
Can be replaced with optional headphones.
2 VOL (volume) +/– buttons (9)
3 ► (play)/I◄◄ /►►I (search, AMS) buttons
Press ► tó play. While playing, press the I◄◄ side to find beginning of the current or preceding tracks or to search backward, or press the ►►I side to find the beginning of the succeeding tracks or to search forward.
4 TRACK MARK button (21)
5 II (pause) button (7,9)
6 HOLD switch (18)
Slide to lock the controls of the remote controller.
7 ■ (stop) button (7,9)

Additional information

Recording an MD right away!

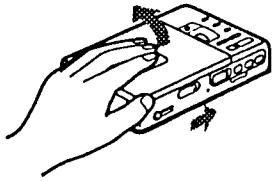
The source sound of CDs or tapes will be sent as an analog signal and recorded digitally. The recorded sound will be stereo. When you record from a digital source, see "Recording with digital input" (page 11).

1 Make connections.

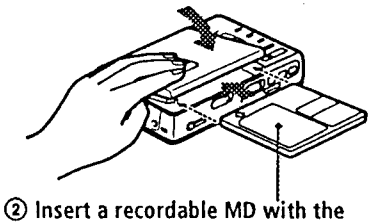


* Use the RK-G136 connecting cord (not supplied) to connect to a portable CD player having a stereo-mini jack.

2 Insert a recordable MD.

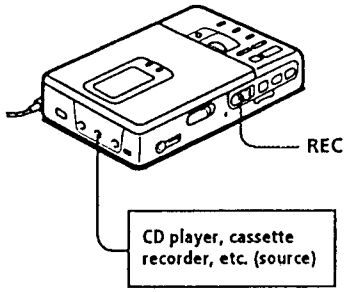


① Slide OPEN and open the lid.



② Insert a recordable MD with the label side facing up, and press the lid down to close.

3 Record an MD.



① Slide REC to the right while pressing its button.
"REC" lights up and recording starts.

② Play the CD or tape you want to record.

To stop recording, press ■.
"Toc Edit" flashes to record data of the recording (the track's start and end points, etc.). Do not move or jog the recorder or disconnect the power source while the indication is flashing in the display.

To	Press
Pause	❚❚[1] Press ❚❚ again to resume recording.
Add recording to the end of the previous recording.	END SEARCH and slide REC.
Record over partway through the previous recording.	►, ►►I or I◄◄ to find the start point of recording and press ■ to stop. Then slide REC.
Remove the MD.	■ and open the lid.[2]

[1] A new track is added at the point where you pressed ❚❚, and the recording will be marked with the new track number when you resume recording.
[2] Once you open the lid, the point to start recording will change to the beginning of the first track. When recording on a recorded MD, check the point to start recording on the display.

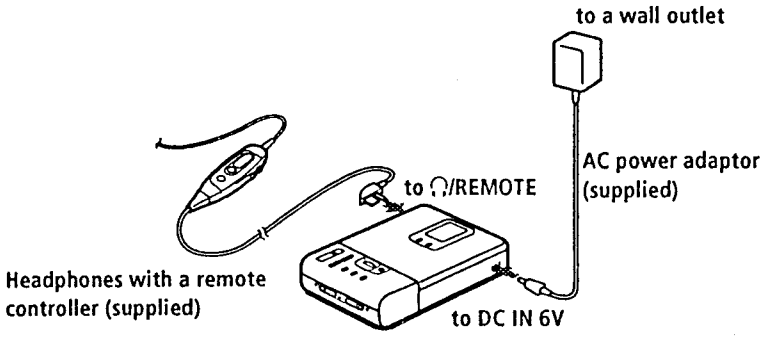
If the recording does not start
- Make sure the recorder is not locked (page 18).
- Make sure the MD is not record-protected (page 27).
- Premastered MDs cannot be recorded over.

Tips
- The level of the recorded sound is adjusted automatically.
- You can monitor the sound being recorded. Connect the supplied headphones with remote controller to Ω/REMOTE and adjust the volume by pressing VOLUME +/– (VOL +/– on the remote controller). Sound levels are copied onto the MD automatically and independently of the volume for monitoring.

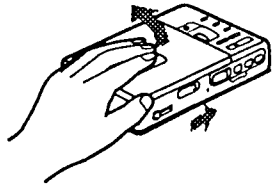
Playing an MD right away!

You can also use the rechargeable battery or dry batteries (see pages 24, 25).

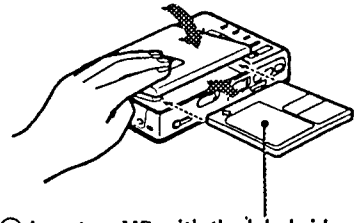
1 Make connections.



2 Insert an MD.

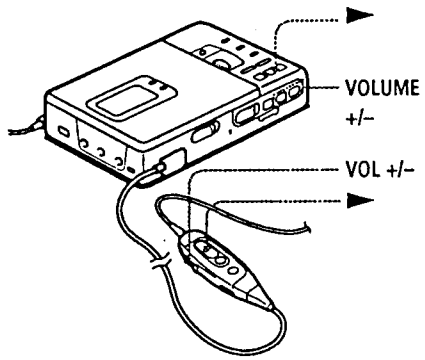


① Slide OPEN and open the lid.



② Insert an MD with the label side facing up, and press the lid down to close.

3 Play an MD.



① Press ►.
A short beep sounds in the headphones.

② Press VOLUME +/– to adjust the volume.
You can check the volume in the display.

To stop play, press ■.
A long beep sounds in the headphones.

To	Press (Beeps in the headphones)
Pause	❚❚ (Continuous short beeps) Press ❚❚ again to resume play.
Find the beginning of the current track	I◄◄ once (Three short beeps)
Find the beginning of the next track	►►I once (Two short beeps)
Go backwards while playing[1)]	keep pressing I◄◄
Go forward while playing[1)]	keep pressing ►►I
Remove the MD	■ and open the lid.[2)]

1) To go backward or forward quickly without listening, press ❚❚ and keep pressing I◄◄ or ►►I.
2) Once you open the lid, the point to start play will change to the beginning of the first track.

If the play does not start
Make sure the recorder is not locked (page 18).

Tip
The recorder automatically switches to play the stereo or monaural sound according to the recorded sound.

Two ways of connection to a sound source

The input jack of this recorder works as both digital and analog input jack. Connect the recorder to a CD player or a cassette recorder using either digital input or analog input. To record, see "Recording with digital input" (page 11) to record using digital input, and "Recording an MD right away!" (page 6) to record using analog input.

Difference between digital and analog inputs

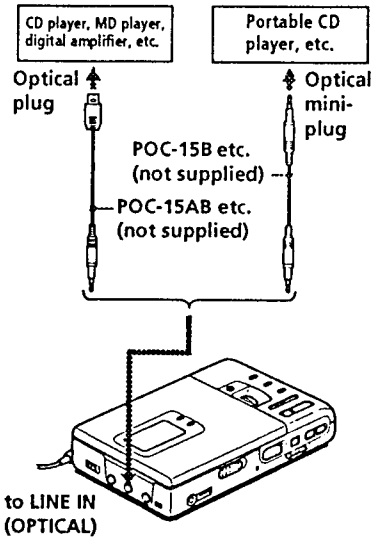
Difference (connection) \ Input	Digital input	Analog (line) input
Connectable source	Equipment with an optical digital output jack	Equipment with an analog (line) output jack
Usable cord	Digital cable (with an optical or an optical-mini plug)	Line cable (with 2 phono plugs or a stereo-mini plug)
Signal from the source	Digital	Analog Even when a digital source (such as a CD) is connected, the signal sent to the recorder is analog.
Recorded track numbers	Marked (copied) automatically •at the same positions as the source. •when the recorder is paused while recording.	Marked •after more than 2 seconds of silence. •when the recorder is paused while recording. You can erase unnecessary marks after recording ("Erasing a track mark", page 21).
Recorded sound level	Same as the source	Adjusted automatically. Can also be adjusted manually ("Adjusting the recording level", page 13).

Note

Track marks may be copied incorrectly :
•when you record from some CD players or multi disc players using digital input.
•when the source is in shuffle or program play mode while recording using digital input. In this case, play the source in normal play mode.

Recording with digital input

This unit has a built-in sampling rate converter so that you can record programs from digital equipment using other sampling rates, such as a BS tuner or a DAT deck.



Insert a recordable MD and start recording.
To record, see "Recording an MD right away !" (page 6). To record from a portable CD player, set the CD player to pause and then start recording.

LINE IN (OPTICAL) jack is for both digital and analog input

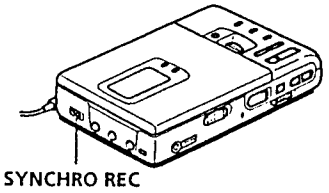
The recorder automatically recognizes the line cable and switches to digital or analog input.

Notes

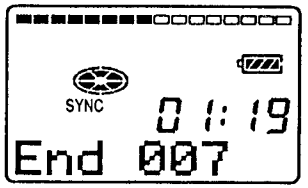
•You can make a digital recording only from an optical type output.
•Some portable CD players with the ESP* system cannot send out digital signals when it is activated. In this case, release the ESP system.
* Electronic Shock Protection

To start/stop recording with the player (Synchro-recording)

You can easily make digital recordings of a digital source on an MD.
Before synchro-recording, make connections to the digital source with a digital cable and the power source, and insert a recordable MD.



1 Slide SYNCHRO REC to ON.
"SYNC" appears in the display.



2 Slide REC to the right while pressing its button.
The recorder stands by for recording.
The recorder starts recording when you start playing the source player.

To stop synchro-recording, Press ■.

Tip

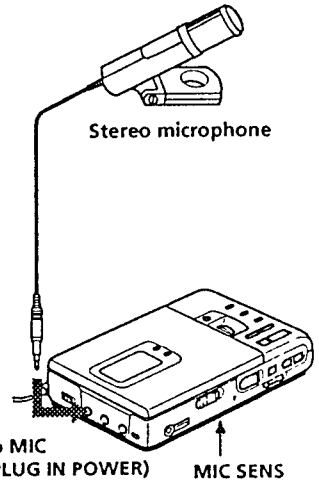
When there is no sound from the player more than 3 seconds during synchro-recording, the recorder stands by for recording automatically. When the sound comes from the player again, the recorder starts synchro-recording again.

Note

If you record in monaural, do steps 1 and 2 in "Recording in monaural for double the normal recording time of an MD" (page 12). before doing the synchro-recording steps.

Recording from a microphone

Connect a stereo microphone ECM-909A, ECM-MS907, ECM-717, etc., (not supplied) to the MIC (PLUG IN POWER) jack.



1 Select the input level with MIC SENS (on the bottom of the recorder). Usually, set it to HIGH. When you record loud sound such as a live concert, set it to LOW.

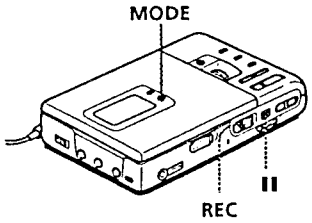
2 Insert a recordable MD and start recording.
Slide REC to the right while pressing its button.
"REC" lights up and recording starts.
For details, see "Recording an MD right away! " (page 6).

Note

To record from a microphone, you must first disconnect any digital source. If connected, the recorder will not switch to microphone input.

Recording in monaural for double the normal recording time of an MD

For longer recordings, choose to record in monaural sound. The recording time becomes double the normal.



1 While pressing **II**, slide REC to the right.
The recorder stands by for recording.

2 Press MODE.
"Mono REC" appears in the display, and the recorder switches to monaural recording.
Press MODE again to record in stereo sound.

3 Press **II** again to start recording.

4 Play the sound source.

To stop recording, press ■.

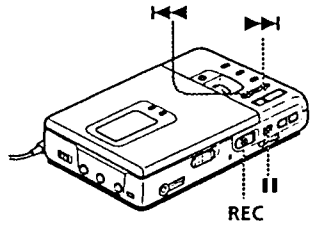
The recorder switches back to stereo recording when you record the next time.

Notes

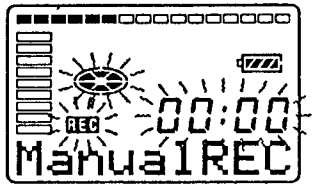
- If you record in monaural sound from a stereo source, the sounds from left and right will be mixed.
- You cannot record in monaural, if SYNCRO REC is slide to ON.
- The MDs recorded in monaural sound can be played back only with an MD player/recorder that has the monaural playing function.

Adjusting the recording level (Manual recording)

When you record with an analog input, the sound level is adjusted automatically. If necessary, you can set the level manually.



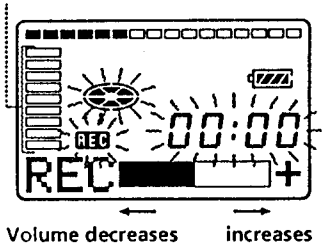
1 While holding down **II**, hold REC to the right for more than 2 seconds.
"ManualREC" appears and the recorder stands by for recording.
To return to the automatic control, while the recorder is in record pause mode, hold REC to the right for more than 2 seconds.



2 Play the source.

3 While observing the level meter in the display, adjust the recording level by pressing ▶▶| (+) or |◀◀ (–).
Set the level so that it hits the second indicator from the top when the recorder receives the maximum sound.

Level meter



Volume decreases increases

Note

The recording level should be adjusted while the recorder is in standby mode. You cannot adjust it while recording.

4 Press **II** again to start recording.

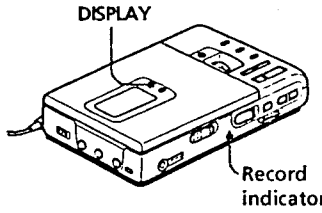
To stop recording, press ■.

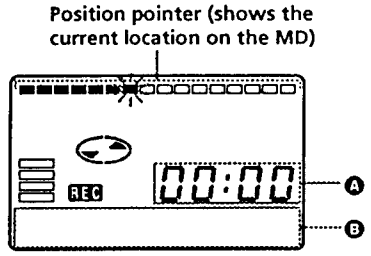
The recording level control is switched back to automatic control.

When you record with microphone input, select the input level with MIC SENS (page 12).

Checking the remaining time or the recording position

1 Press DISPLAY while recording or in stop mode. Each time you press the button, the display changes as follows.





While recording

A	B
Elapsed time	Track number
Remaining time for recording	Track number
Current time[1]	Current date[1]

[1] Appears only when the clock is set.

In stop mode

A	B
Elapsed time	Track number
Remaining time for recording	Track name[1]
Remaining time after the current location	Disc name[2]
Current time[3]	Current date[3]

[1] The number of the track appears when the track has no name.
[2] Remaining number of tracks appears when the MD has no disc name.
[3] Appears only when the clock is set.

To know the recording condition

The record indicator lights up or flashes according to the recording condition.

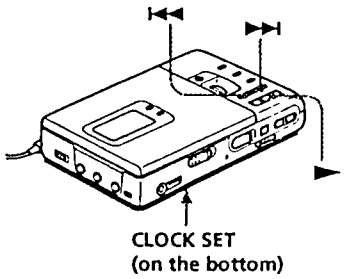
Recording condition	Record indicator
While recording	lights up flashes according to the loudness of the source while recording with a microphone (voice mirror)
Recording standby	flashes
Less than 3 minutes' recording time available	slowly flashes

Tip

If you want to check the playing position or track name while playing, see page 18.

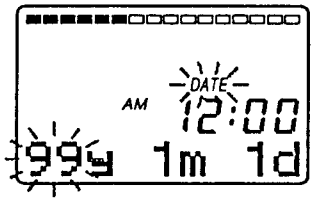
Setting the clock to stamp the recorded time

To stamp the date and time on the MD when you record, you first need to set the clock. When you use the recorder for the first time or after a long period of disuse, charge the built-in battery for the clock after setting the clock.



1 Connect the power source.
Use the supplied AC power adaptor.

2 Press CLOCK SET at the bottom of the recorder.
Use a pointed object.
The digits of the year flash.



3 Enter the current year by pressing ⏮ or ⏭.
To change the digits rapidly, keep pressing ⏮ or ⏭.

4 Press ►.
The digit of the month flashes.

5 Repeat steps 3 and 4 to enter the current month, date, hour, and minute.
When you press ► to set the minute, the clock starts operating.

If you make a mistake while setting the clock

Press ■, and set the clock again from step 2. You can skip a step by pressing ►.

To display the current time

When the recorder is not operating or while recording, press DISPLAY repeatedly until the current time appears in the display.

To display the time in the 24-hour system

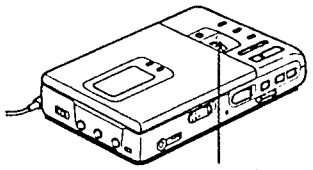
While setting the clock, press DISPLAY. To display the time in the 12-hour system, press DISPLAY again.

Charging the built-in battery for the clock

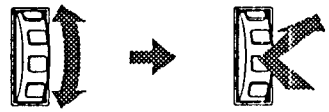
After setting the clock, leave the recorder connected to the AC power for about 2 hours to charge the built-in battery for the clock. Once charged, the built-in battery should last about a month without connecting to any of the power sources. The recorder will automatically charge the built-in battery while connected to AC power, dry batteries or a rechargeable battery.

Selecting the track number or track name directly

You can select the desired track directly by using the vertical jog dial.



1 Rotate the jog dial to select a track, and press it to play the selected track.



When you rotate the jog dial, the track name* appears in the display. To play the selected track, press the jog dial.

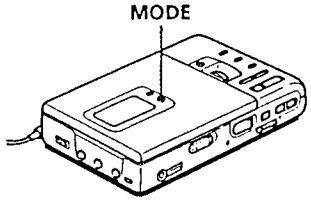
* If the track has no name, only the track number appears in the display.

Tip

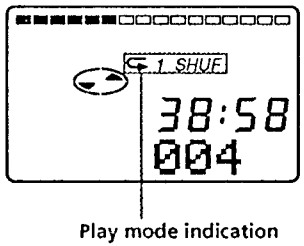
If you select a track in shuffle play mode, shuffle play starts from the selected track.

Playing tracks repeatedly

You can play tracks repeatedly in three ways — all repeat, single repeat, and shuffle repeat.



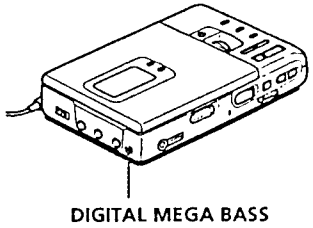
1 Press MODE while the recorder is playing an MD.
Each time you press MODE, the play mode indication changes as follows.



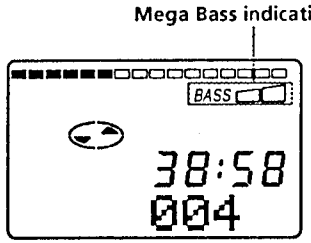
Indication	Play mode
none (normal play)	All the tracks are played once.
"↻" (all repeat)	All the tracks are played repeatedly.
"↻ 1" (single repeat)	A single track is played repeatedly.
"↻ SHUF" (shuffle repeat)	All the tracks are played repeatedly in random order.

Emphasizing bass (DIGITAL MEGA BASS)

Mega Bass function intensifies low frequency sound for richer quality audio reproduction. It affects only with the headphones.



1 Press DIGITAL MEGA BASS.
Each time you press DIGITAL MEGA BASS, the Mega Bass indication changes as follows.



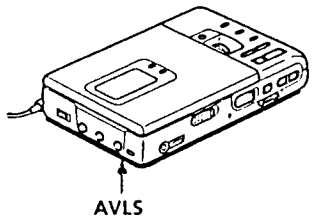
Indication	Play mode
none	Normal play
"BASS ▭"	Mega Bass (slight effect)
"BASS ▭▭"	Mega Bass (strong effect)

Notes

- If the sound is distorted when emphasizing bass, turn down the volume.
- Mega Bass function does not affect the sound being recorded.
- Mega Bass dose not function when LINE OUT jack on the recorder is connected with a line cable.

Protecting your hearing (AVLS)

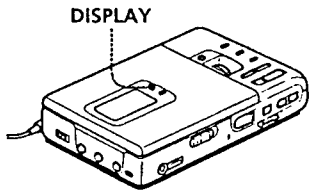
The AVLS (Automatic Volume Limiter System) function keeps down the maximum volume to prevent excessive sound from harming your ears.

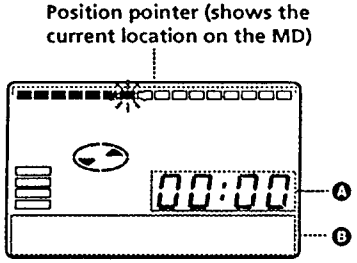


1 Set AVLS at the bottom of the recorder to LIMIT.
When you try to turn the volume, "AVLS" appears in the display. The volume is kept at a moderate level.

Checking the remaining time or the playing position

1 Press DISPLAY while playing. Each time you press DISPLAY, the display changes as follows.





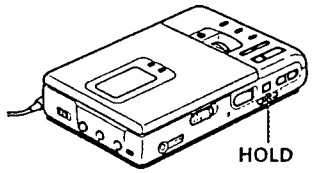
A	B
Elapsed time	Track number
Remaining time of the current track	Track name[1]
Remaining time after the current location	Disc name[2]
Recorded time[3]	Recorded date[3]

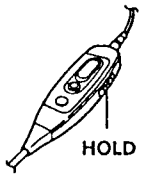
[1] Track number appears when the MD has no track name.
[2] Remaining number of the disc appears when the disc has no name.
[3] If you record without setting the clock or play an MD that has no recorded date, "--y--m--d" and "--:--" appear.

If you want to check the remaining time or the recording position while recording or in stop mode, see page 14.

Locking the controls

To prevent the buttons from being accidentally operated when you carry the recorder, use this function.



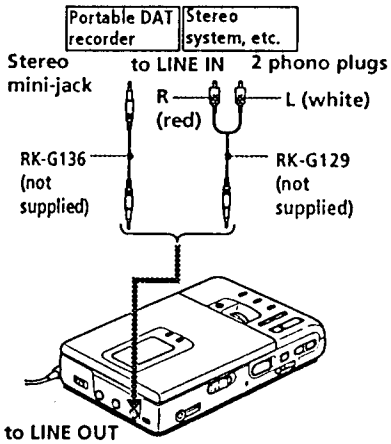


1 Slide HOLD in the direction of the →.

On the recorder, slide HOLD to lock the controls of the recorder. On the remote controller, slide HOLD to lock the controls of the remote controller. Slide HOLD in the opposite direction of the arrow to unlock the controls.

Connecting to a stereo system

Connect the LINE OUT jack of the recorder to the LINE IN jacks of an amplifier or a tape player with a line cable (RK-G129 or RK-G136, not supplied). The output is analog. The recorder plays the MD digitally and sends analog signals to the connected equipment.



Note

The Mega Bass dose not function or will be cancelled when the LINE OUT jack is connected with a line cable.

▶*Editing recorded tracks*

You can edit your recordings by adding/erasing track marks or labeling tracks and MDs. Premastered MDs cannot be edited.

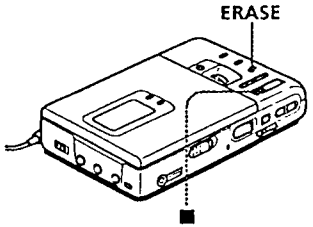
Notes on editing

- Do not move or jog the recorder while "Toc Edit" is flashing in the display.
- You cannot edit tracks on an MD that is record-protected. Before editing tracks, close the tab on the side of the MD.

Erasing tracks

To erase a track

Note that once a recording has been erased, you cannot retrieve it. Check the track number before erasing.



1 Press ERASE while playing the track you want to erase.
"Erase OK?" and "Push Erase" appear in the display alternately, and the recorder plays the selected track repeatedly. To cancel erasing, press ■.

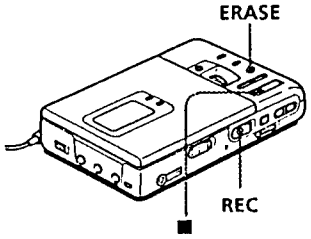
2 Check the track number in the display and press ERASE again.
The track is erased from the MD and the remaining tracks are renumbered.

To erase a part of a track

Add track marks at the beginning and the end of the part you want to erase, then erase the part.

To erase the whole disc

You can quickly erase all the tracks and data of the MD at a time.
Note that once a recording has been erased, you cannot retrieve it. Be sure to check the contents of the disc you want to erase.

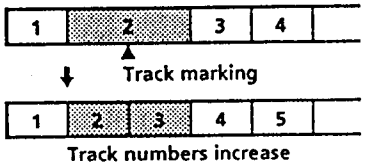


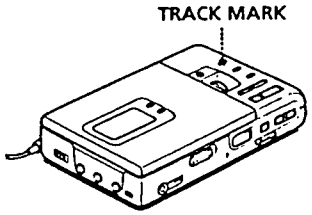
1 In stop mode, keep pressing ERASE and slide REC to the right.
"All Erase?" and "Push Erase" appear in the display alternately. To cancel erasing, press ■.

2 Press ERASE again.
"Toc Edit" flashes in the display. When erasing finishes, "BLANK DISC" appears.

Adding a track mark

You can add track marks so that the separated part after the track mark is as a new track.
The track numbers will increase as follows.





1 While playing or pausing an MD, press TRACK MARK on the recorder at the point you want to mark.
"MARK ON" appears in the display, and a track mark is added. The track number will increase by one.

To add track marks while recording

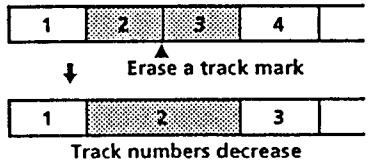
Press TRACK MARK on the recorder or the remote commander.

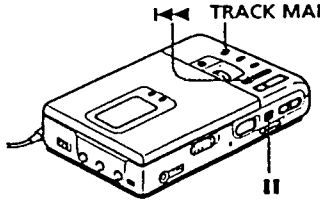
Note

TRACK MARK on the remote controller does not function during playback.

Erasing a track mark

When you record with analog (line) input, unnecessary track marks may be recorded. You can erase a track mark to combine the tracks before and after the track mark. The track numbers will change as follows.





1 While playing the track with the track mark you want to erase, press ❚❚ to pause.

2 Find the track mark by pressing ⏮ slightly.
For example, to erase the third track mark, find the beginning of the third track. "00:00" appears in the display.

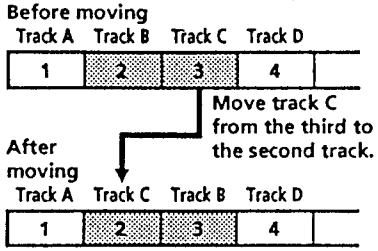
3 Press TRACK MARK to erase the mark.
"MARK OFF" appears in the display. The track mark is erased and the two tracks are combined.

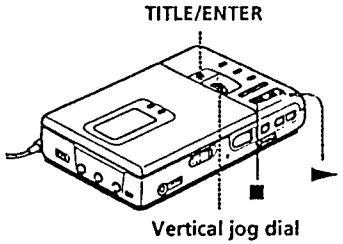
Tip

The combined track whose mark has been erased is recorded with the date and time of the beginning of the first of the two combined tracks.

Moving recorded tracks

You can change the order of the recorded tracks.


Before moving
Track A Track B Track C Track D
1 2 3 4
Move track C from the third to the second track.
After moving
Track A Track C Track B Track D
1 2 3 4



1 While playing, keep pressing ► and press TITLE/ENTER.
The recorder plays the selected track repeatedly.
For example above, "MV003→003" appears in the display.

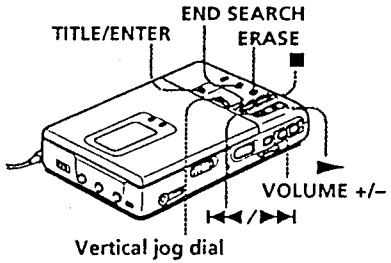
2 Rotate the vertical jog dial to select the new track position.
For example above, rotate the jog dial until "MV003→002" appears in the display.
To cancel moving, press ■.

3 Press TITLE/ENTER again.
Moving is completed and the recorder plays the moved track.

You can also move the track by pressing the jog dial in step 3.

Labeling recordings

You can label the MDs and tracks you recorded with letters, numbers, and marks. Each label can be made up of up to 200 characters, and each MD can hold up to 1700 characters.



1 To label a track, play the track you want to label.
To label an MD, insert the recordable MD you want to label.
If an MD is already inserted, press ■ to stop.

2 Press TITLE/ENTER.
If you have selected a track in step 1 above, the recorder will play that track repeatedly.
A cursor flashes in the display.

3 Use the vertical jog dial to select and enter a character.

Rotate the jog dial to select a character, and press the jog dial to enter the selected character. The cursor shifts rightward and stands by for the input of the next character.

Press	To
►	Select the first of capital letters, small letters, and numbers quickly.
I◄◄/►►I	Move the cursor to the left or right.
END SEARCH	Insert a space.
ERASE	Delete a character.
■	Cancel labelling.

4 Repeat step 3 until you have entered all the characters for the label.

5 Press TITLE/ENTER.
Labeling is completed.

To cancel labelling
Press ■.

Available characters

- Capital and small letters of the English alphabet
- Numbers 0 to 9
- ! " # $ % & ( ) * + − . ; < = > ? @ _ ` ' , / : _ (space)

To relabel recordings

Do steps 1 and 2 to display the label of the track or MD. Enter a new character over the one you want to change, then press TITLE/ENTER.

Notes

- You cannot relabel premastered MDs or label MDs that have not been recorded.
- The recorder is able to display "Kana" characters. But you cannot label with them on this recorder.

▶Power sources

You can use the recorder on house current or as follows.
In the recorder ...
- a lithium ion rechargeable battery (supplied)

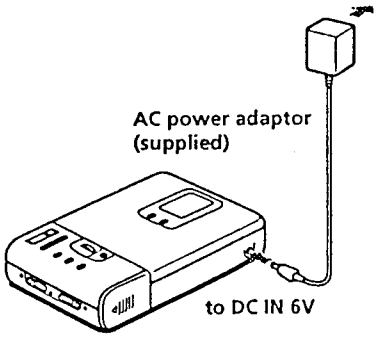
With supplied battery case ...
- dry batteries (not supplied)

It is preferable to use the recorder on house current when recording for a long time.

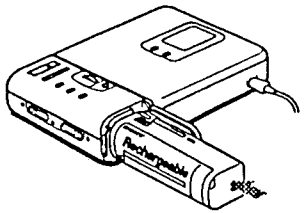
Using on a lithium ion rechargeable battery

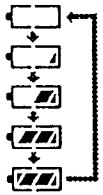
Before using the supplied LIP-12(H) lithium ion rechargeable battery for the first time, charge it in the recorder.

1 Connect the supplied AC power adaptor.



2 Insert the LIP-12(H) into the recorder and close the lid.





Battery indication appears in the display and charging starts.
When charging is completed, battery indication disappears.

Charging time

To charge a completely discharged battery, it takes the following time.

80%	Approx. 2.5 hours
100%	Approx. 5 hours

Tip

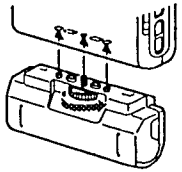
You can use the recorder while charging.

Notes

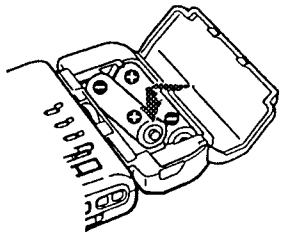
- Be sure to use the supplied AC power adaptor.
- Charging time may vary depending on the battery condition.

Using on dry batteries

1 Attach the supplied battery case.



2 Insert two LR6 (size AA) dry batteries (not supplied).



Battery life[1]

Batteries	Recording[2]	Playback
LIP-12(H) lithium ion rechargeable battery	Approx. 5 hours	Approx. 8 hours
Two LR6 (size AA) Sony alkaline dry batteries	----[3]	Approx. 6.5 hours
LIP-12(H) + Two LR6 (size AA)	----[3]	Approx. 15 hours

[1] The battery life may be shorter due to operating conditions and the temperature of the location.
[2] When you record, use a fully charged rechargeable battery.
[3] Recording time may differ according to the alkaline batteries.

When to replace the batteries

When the dry batteries or rechargeable battery are weak, flashing ▭ or "LOW BATT" appear in the display. Replace the dry batteries or charge the rechargeable battery.

Precautions

On safety
Do not put any foreign objects in the DC IN 6 V jack.

On power sources
- Use house current, lithium ion rechargeable battery, two LR6 (size AA) batteries, or car battery.
- For use in your house: Use the AC power adaptor supplied with this recorder. Do not use any other AC power adaptor since it may cause the recorder to malfunction.

- The recorder is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the recorder itself has been turned off.
- If you are not going to use this recorder for a long time, be sure to disconnect the power supply (AC power adaptor, dry batteries, rechargeable battery, or car battery cord). To remove the AC power adaptor from the wall outlet, grasp the adaptor plug itself; never pull the cord.
- For use in the car : Use the CPA-9 car connecting pack (not supplied)

On heat build-up
Heat may build up in the recorder if it is used for an extended period of time. In this case, leave the recorder turned off until it cools down.

On installation
- Never use the recorder where it will be subjected to extremes of light, temperature, moisture or vibration.
- Never wrap the recorder in anything when it is being used with the AC power adaptor. Heat build-up in the recorder may cause malfunction or damage.

On the headphones
Road safety

Do not use headphones while driving, cycling, or operating any motorized vehicle. It may create a traffic hazard and is illegal in many areas. It can also be potentially dangerous to play your recorder at high volume while walking, especially at pedestrian crossings. You should exercise extreme caution or discontinue use in potentially hazardous situations.

Preventing hearing damage

Avoid using headphones at high volume. Hearing experts advise against continuous, loud and extended play. If you experience a ringing in your ears, reduce the volume or discontinue use.

Caring for others

Keep the volume at a moderate level. This will allow you to hear outside sounds and to be considerate of the people around you.

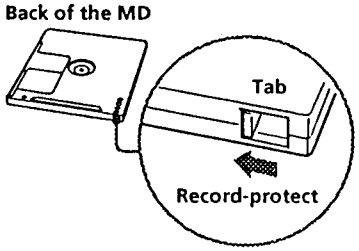
On the MiniDisc cartridge
- Do not break open the shutter.
- Do not place the cartridge where it will be subject to light, extreme temperatures, moisture or dust.

On cleaning
- Clean the recorder casing with a soft cloth slightly moistened with water or a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzene as it may mar the finish of the casing.
- Wipe the disc cartridge with a dry cloth to remove dirt.
- Dust on the lens may prevent the unit from operating properly. Be sure to close the disc compartment lid after inserting and ejecting an MD.

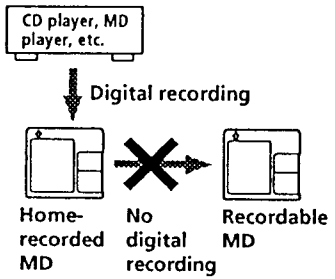
Notes on batteries
Incorrect battery usage may lead to leakage of battery fluid or bursting batteries. To prevent such accidents, observe the following precautions:
- Install the + and − poles of the batteries correctly.
- Do not install new and used batteries or different kinds of batteries together.
- Do not try to recharge dry batteries.
- When the recorder is not to be used for a long time, be sure to remove the batteries.
- If a battery leak should develop, carefully and thoroughly wipe away battery fluid from the battery compartment before inserting new ones.

Note on mechanical noise
The recorder produces out mechanical noise while operating, which is caused by the power-saving system of the recorder and it is not a problem.

To protect a recorded MD
To record-protect an MD, slide open the tab at the side of the MD. In this position, the MD cannot be recorded. To record again, slide the tab back so the tab is visible.



Note on digital recording
This recorder uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software. You can only make copies from a home-recorded MD by using the analog (line out) connections.



If you have any questions or problems concerning your recorder, please consult your nearest Sony dealer.

Troubleshooting

Should any problem persists after you have made these checks, consult your nearest Sony dealer.

Symptom	Cause/Solution
The recorder does not work or works poorly.	• Audio sources may not be securely connected. ➡ Disconnect the audio sources once and connect them again (pages 6,11). • Moisture has condensed inside the recorder. ➡ Take the MD out and leave the recorder in a warm place for several hours until the moisture evaporates. • The rechargeable battery or dry batteries are weak (▭ or "LOW BATT" flashes). ➡ Charge the rechargeable battery or replace the dry batteries (pages 24, 25). • The rechargeable battery or dry batteries have been installed incorrectly. ➡ Install the batteries correctly (page 25). • You pressed a button while the disc indication was rotating quickly. ➡ Wait until the indication rotates slowly. • The recording volume is too low. • The AC adaptor was unplugged during recording or a power outage occurred. • While operating, the recorder received a mechanical shock, too much static, abnormal power voltage caused by lightning, etc. ➡ Restart the operation as follows. 1 Disconnect all the power sources. 2 Leave the recorder for about 30 seconds. 3 Connect the power source.
No sound comes through the headphones.	• The headphones plug is not firmly connected. ➡ Connect the headphones with a remote controller plug firmly to ∩/REMOTE. • Volume is too low. ➡ Adjust the volume by pressing VOLUME +/– (VOL +/– on the remote controller). • AVLS is on. ➡ Side AVLS to NORMAL (page 17).
An MD is not played from the first track.	• Disc playing stopped before it came to the last track. ➡ Press ⏮ repeatedly or open and close the lid once to go back to the beginning of the disc, and restart playing after checking the track number in the display.

Symptom	Cause/Solution
Playback sound skips.	• The recorder is placed where it receives continuous vibration. ➡ Put the recorder on a stable place. • A very short track may cause sound to skip.
Sound has a lot of static.	• Strong magnetism from a television or such device is interfering with operation. ➡ Move away from the source of strong magnetism.
Cannot find the track marks.	• You pressed ⏸ after pressing ⏮ or ⏭. ➡ Press ⏸ before pressing ⏮ or ⏭.
Charging the rechargeable battery does not start.	• The rechargeable battery has been inserted incorrectly or the AC power adaptor has been connected incorrectly. ➡ Insert the battery correctly or connect the AC power adaptor correctly.
The clock loses time or the display flashes. The recording date was not stamped onto the disc.	• The built-in battery for a clock is weak. ➡ Connect the AC power adaptor to DC IN 6 V on the recorder and the wall outlet to charge the built-in battery. After charging, set the clock again. Note that the clock normally loses about 2 minutes per month (page 15).

System limitations

The recording system in your MiniDisc recorder is radically different from those used in cassette and DAT decks and is characterized by the limitations described below. Note, however, that these limitations are due to the inherent nature of the MD recording system itself and not to mechanical causes.

Symptom	Cause
"TR FULL" appears even before the disc has reached the maximum recording time (60 or 74 minutes).	When 254 tracks have been recorded on the disc, "TR FULL" appears regardless of the total recorded time. More than 254 tracks cannot be recorded on the disc. To continue recording, erase unnecessary tracks.
"TR FULL" appears even before the disc has reached the maximum track number or recording time.	Repeating recording and erasing may cause fragmentation and scattering of data. Although those scattered data can be read, each fragment is counted as a track. In this case, the number of tracks may reach 254 and further recording is not possible. To continue recording, erase unnecessary tracks.
Track marks cannot be erased.	When the data of a track is fragmented, the track mark of a fragment under 12 seconds long cannot be erased.
The remaining recording time does not increase even after erasing numerous short tracks.	Tracks of under 12 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.
The total recorded time and the remaining time on the disc may not total the maximum recording time (60 or 74 minutes).	Recording is done in minimum units of 2 seconds each, no matter how short the material. Even if the last unit of recording is less than 2 seconds, it is counted as a unit of 2 seconds. Then 2 seconds' space is put before recording starts again to prevent the last unit of the previous track from being erased. The contents recorded may thus be shorter than the maximum recording capacity.
The edited tracks may exhibit sound dropout during search operations.	The fragmentation of data may cause sound dropout while searching because the tracks are played in higher speed than normal playback.

Error messages

If the following error messages flash in the display window, check the chart below.

Error message	Meaning/Remedy
BLANKDISC	• An MD with no recording on it is inserted. ➡ Insert a recorded MD.
DISC ERR	• The recorder cannot read the disc (it's scratched or dirty). ➡ Reinsert or replace the disc.
DISC FULL	• There is no more space to record on the disc (less than 12 seconds available). ➡ Replace the disc.
BUSY	• You tried to operate the recorder while it was accessing the recorded data. ➡ Wait until the message goes out (in rare cases, it may take 2–3 minutes).
NAME FULL	• You tried to enter more than 200 characters for a track or disc name or the total characters entered in an MD is more than 1700. ➡ Enter the characters within the limit.
Hi DC in	• Power supply is too high (The supplied AC power adaptor or the recommended car battery cord is not used). ➡ Use the supplied AC power adaptor or the recommended car battery cord.
HOLD	• The recorder is locked. ➡ Slide HOLD against the allow to unlock the recorder (page 18).
LOW BATT	• Batteries are weak. ➡ Charge the rechargeable battery or replace the dry batteries (pages 24, 25).
MEM OVER	• You tried to record when the recorder is placed where it receives continuous vibration. ➡ Put the recorder on the stable place, and start recording again.
NO COPY	• You tried to make a copy from a disc that is protected by the Serial Copy Management System. You cannot make copies from a digitally connected source which was itself recorded using the digital connection. ➡ Use the analog connection instead (page 6).
NO DISC	• You tried to play or record with no disc in the recorder. ➡ Insert an MD.

Error message	Meaning/Remedy
NO SIGNAL	• The recorder could not detect digital input signals. ➡ Make sure that the source is connected firmly (page 11). • If the error message appears while recording, press ■ to stop recording.
PB ONLY	• You tried to record or edit on a premastered MD (PB means playback.) ➡ Insert a recordable MD.
PROTECTED	• You tried to record or edit on a MD with the tab in the record-protect position. ➡ Slide the tab back (page 27).
SORRY	• You tried to erase a track mark while playing the MD or at the beginning of the first track. • You tried to erase a track mark to combine tracks the recorder cannot combine. (caused by system limitation)
TEMP OVER	• Heat has built up in the recorder. ➡ Let the recorder cool down.
TR FULL	• There is no more space for new data when you are editing the MD. ➡ Erase unnecessary tracks (page 20).
TrPROTECT	• You tried to record or edit on a track that is protected from erasing. ➡ Record or edit on other tracks.

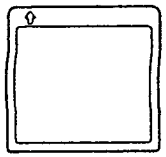
What is MD?

How MiniDisc works

MiniDisc (MD) comes in two types: premastered (prerecorded) and recordable (blank). Premastered MDs, recorded at music studios, can be played back almost endlessly. However, they can't be recorded on or over like cassette tapes. To record, you must use a "recordable MD".

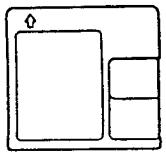
Premastered MDs

Premastered MDs are recorded and played like regular CDs. A laser beam focuses on the pits in the surface of the MD and reflects the information back to the lens in the recorder. The recorder then decodes the signals and plays them back as music.



Recordable MDs

Recordable MDs, which use magneto-optical (MO) technology, can be recorded again and again. The laser inside the recorder applies heat to the MD, demagnetizing the magnetic layer of the MD. The recorder then applies a magnetic field to the layer. This magnetic field corresponds exactly to the audio signals generated by the connected source. (The north and south polarities equate to digital "1" and "0".) The demagnetized MD adopts the polarity of the magnetic field, resulting in a recorded MD.

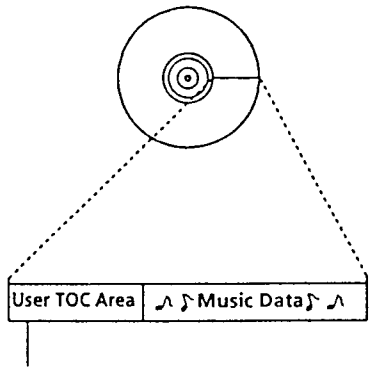


How the MiniDisc got so small

The 2.5-inch MiniDisc, encased in a plastic cartridge that looks like a 3.5-inch diskette (see illustration below), uses a new digital audio compression technology called ATRAC (Adaptive TRansform Acoustic Coding). To store more sound in less space, ATRAC extracts and encodes only those frequency components actually audible to the human ear.

Quick Random Access

Like CDs, MDs offer instantaneous random access to the beginning of any music track. Premastered MDs are recorded with location addresses corresponding to each music selection. Recordable MDs are manufactured with a "User TOC Area" to contain the order of the music. The TOC system is similar to the "directory management system" of floppy disks. In other words, starting and ending addresses for all music tracks recorded on the disc are stored in this area. This lets you randomly access the beginning of any track as soon as you enter the track number (AMS), as well as label the location with a track name as you would a file on a diskette.



Contains the order and start/end points of the music.

Shock-Resistant Memory

One major drawback of optical read systems is that they can skip or mute when subjected to vibration. The MD system resolves this problem by using a buffer memory that stores audio data.

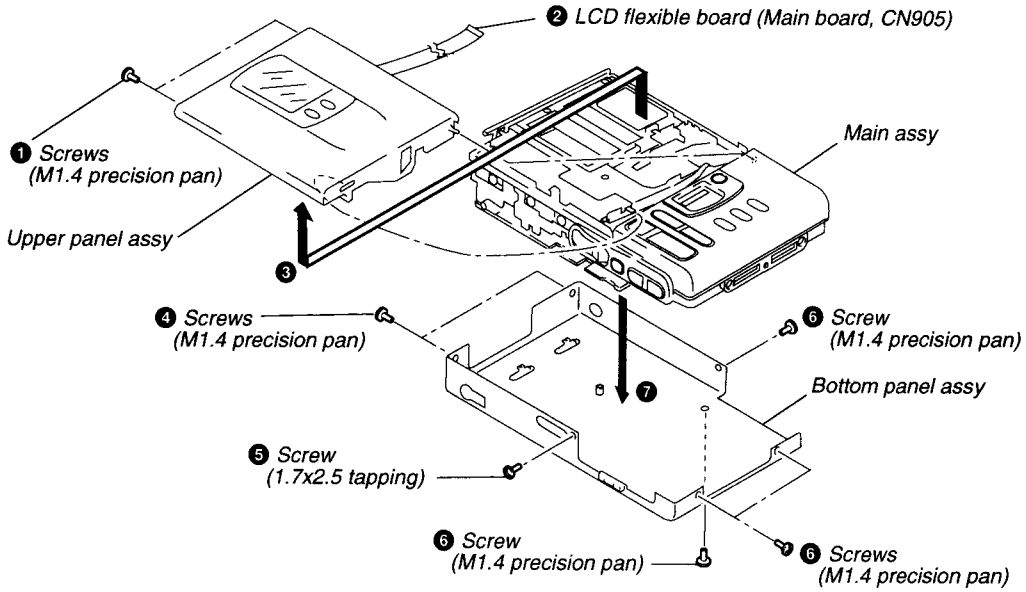
SECTION 3
DISASSENBLY

● The equipment can be removed using the following procedure.

Set ⟶ Panel (upper, bottom) assy ⟶ Main board ⟶ Mechanism deck ⟶ Optical pick-up assy
Control board
Rec board
Battery case assy ⟶ Switch board
Power board
Battery case

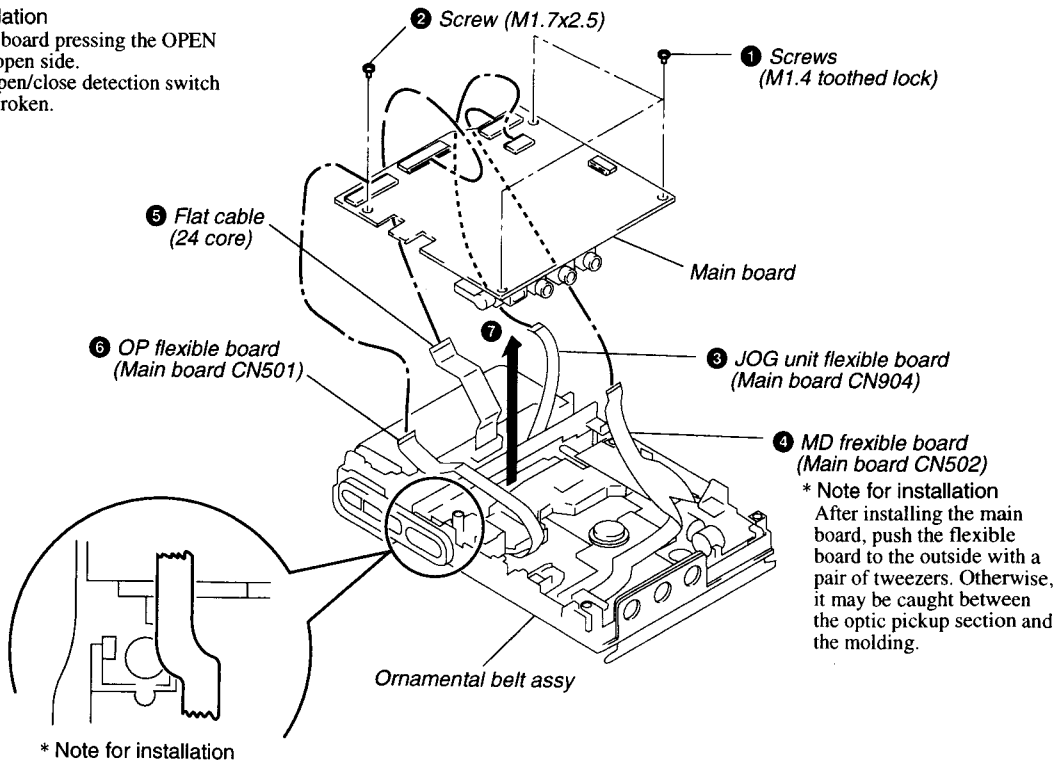
Note : Follow the disassembly procedure in the numerical order given.

3-1. UPPER PANEL ASSY, BOTTOM PANEL ASSY REMOVEL



3-2. MAIN BOARD REMOVEL

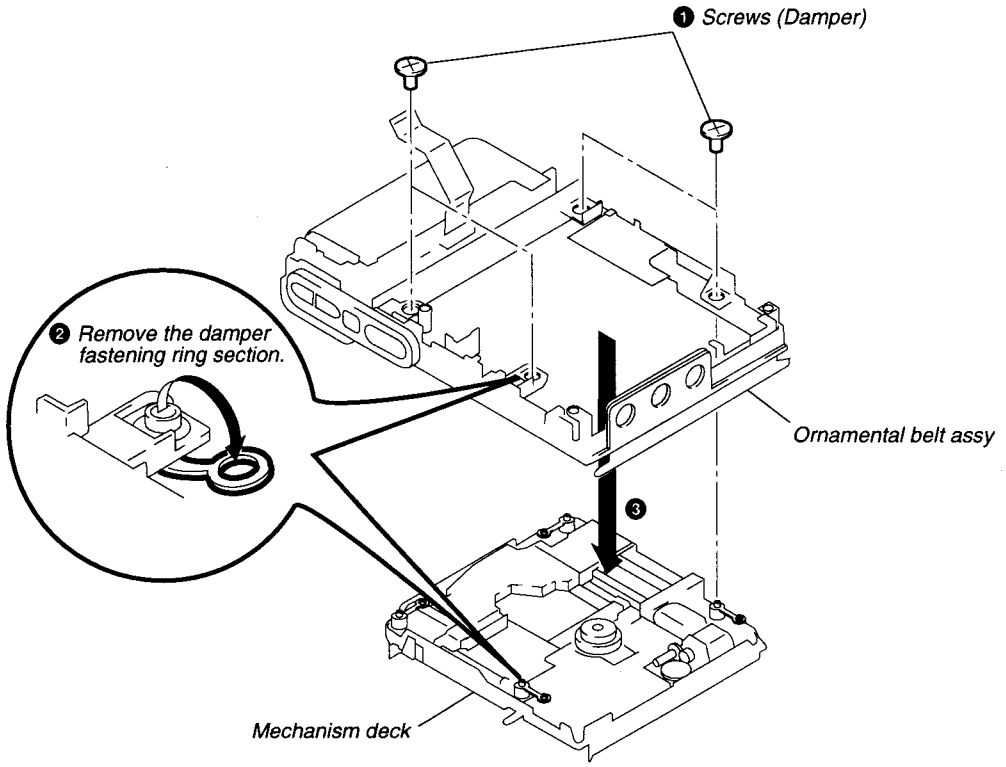
* Note for installation
Install the main board pressing the OPEN button on door open side.
Sometime the open/close detection switch (S817) will be broken.


❷ Screw (M1.7x2.5)
❶ Screws (M1.4 toothed lock)
❺ Flat cable (24 core)
Main board
❼
❻ OP flexible board (Main board CN501)
❸ JOG unit flexible board (Main board CN904)
❹ MD frexible board (Main board CN502)
Ornamental belt assy

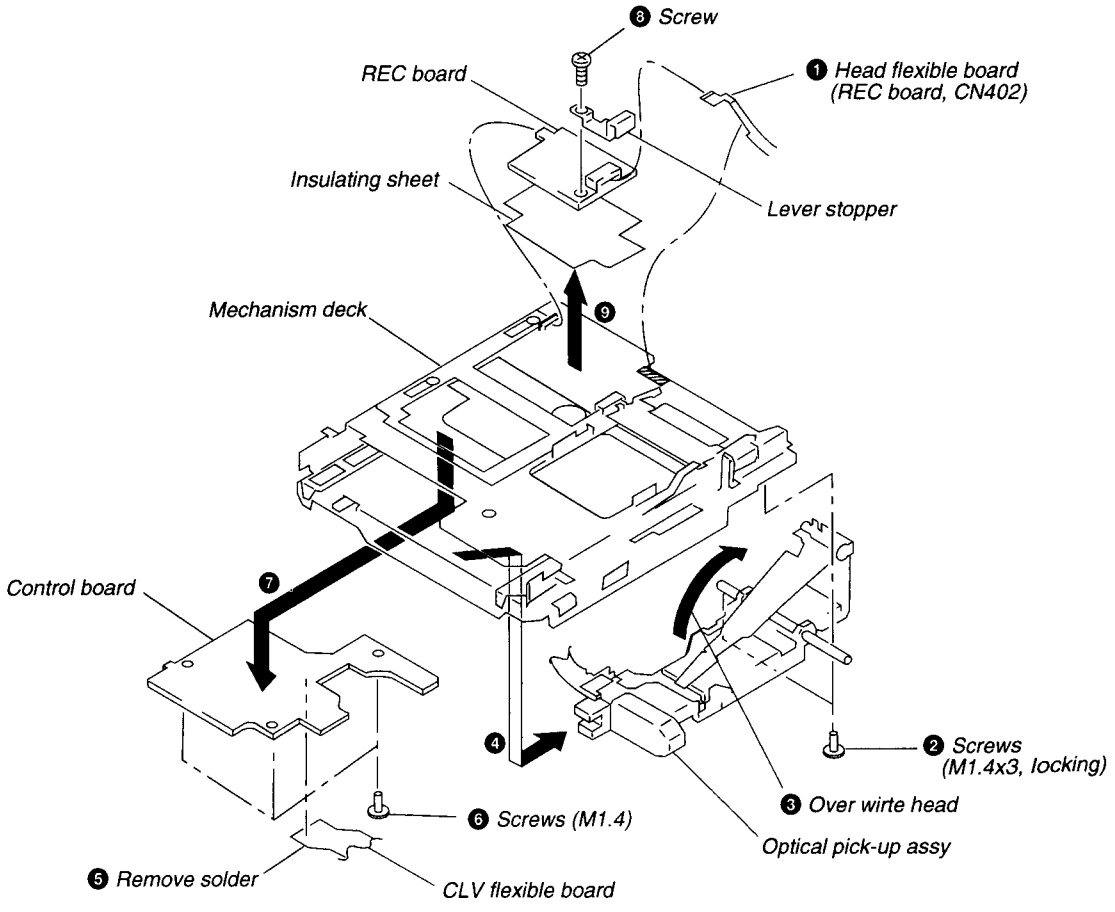
* Note for installation
After installing the main board, push the flexible board to the outside with a pair of tweezers. Otherwise, it may be caught between the optic pickup section and the molding.

* Note for installation
After installing the main board, make the flexible board ride on the molding. If you hold the flexible board and main board with a pair of tweezers, the board will ride correctly.

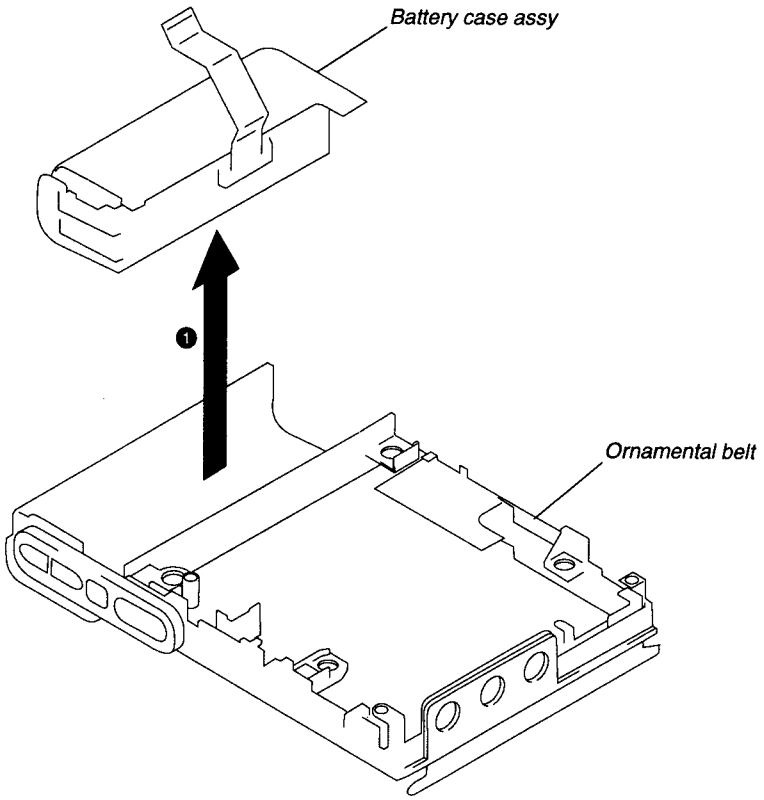
3-3. MECHANISM DECK (MT-MZR30-124) REMOVAL



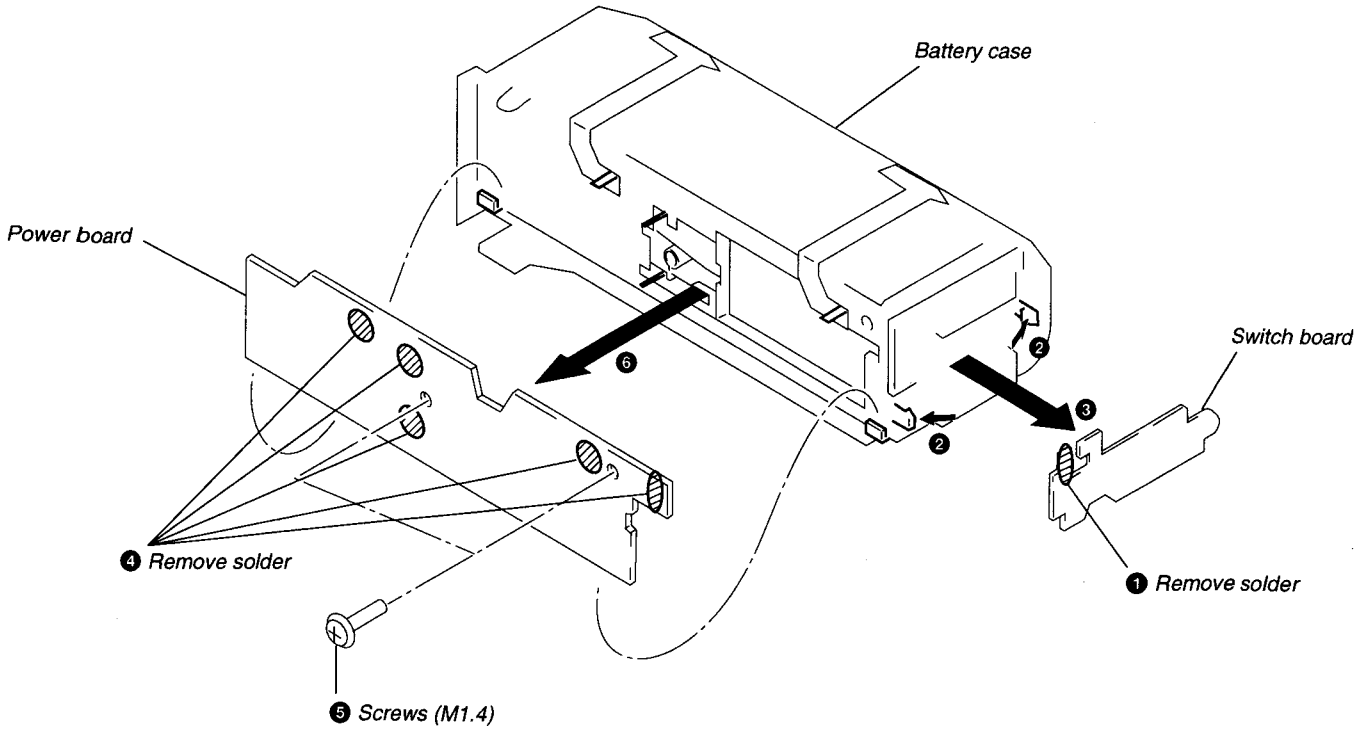
3-4. OPTICAL PICK-UP ASSY, CONTROL BOARD, REC BOARD REMOVEL



3-5. BATTERY CASE ASSY REMOVEL



3-6. SWITCH BOARD, POWER BOARD REMOVEL



SECTION 4
TEST MODE

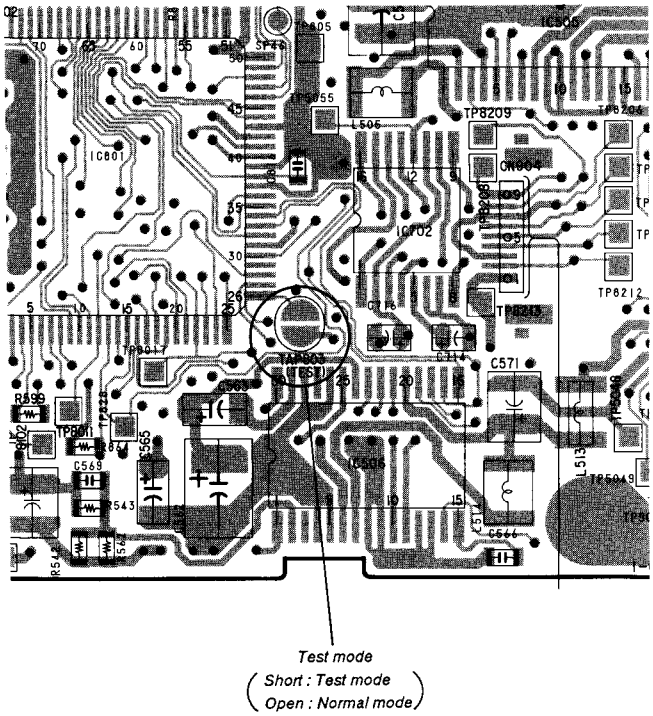
[Outline]

- The general adjustment mode of this unit performs CD and MO adjustments automatically when set. In this mode, the disc is determined if CD or MO and adjustments are automatically performed in order. If errors are detected, the faulty locations are displayed. The servo mode performs each adjustment automatically.

[Setting the Test Mode]

Short-circuit the soldering bridge of TAP803 (TEST) on the main board (connect Pin ㉖ of IC801 to the GND) and turn on the power supply.

[MAIN BOARD] (SIDE A)

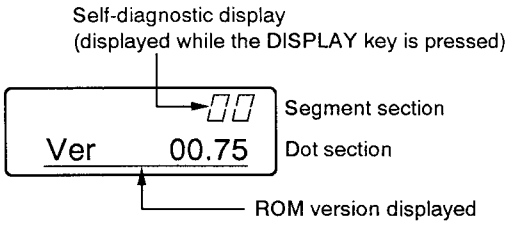


[Exiting the Test Mode]

Turn off the power supply and open the soldering bridge of TAP803 (TEST) on the main board.

[Operations When Test Mode is Set]

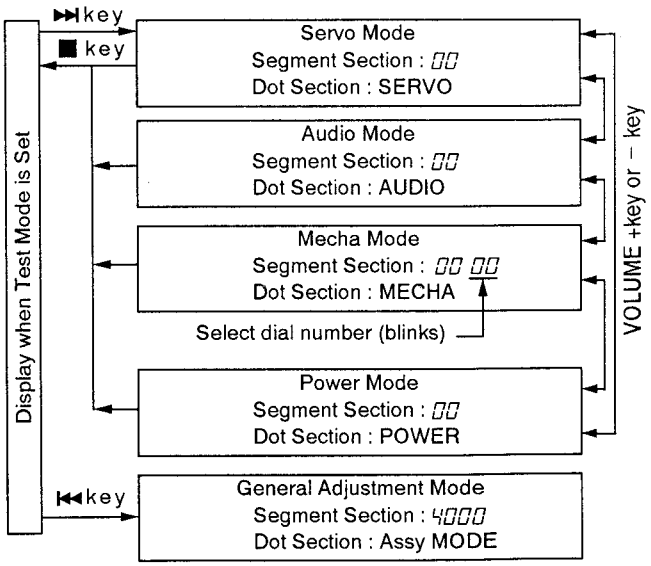
When the test mode is set, the LCD will display as follows.



- The LCD performs the following repeatedly.
  ROM version displayed ➡ all lit ➡ all off
- The display can be held and checked by pressing ▮▮ key.
- The self-diagnostic display appears while the DISPLAY key is pressed.

[Structure of Test Mode]

The test mode of this unit consists of the following five modes.

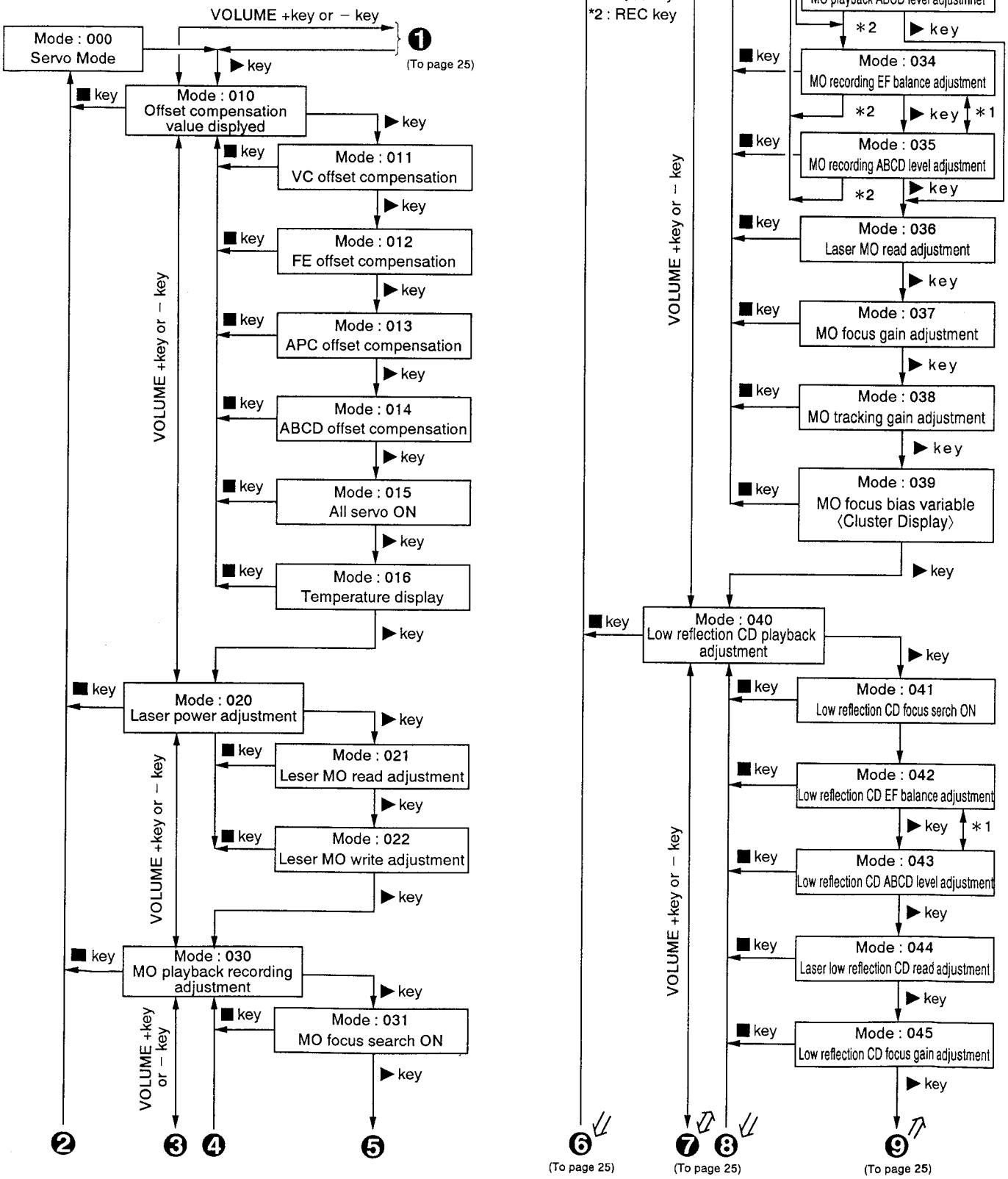


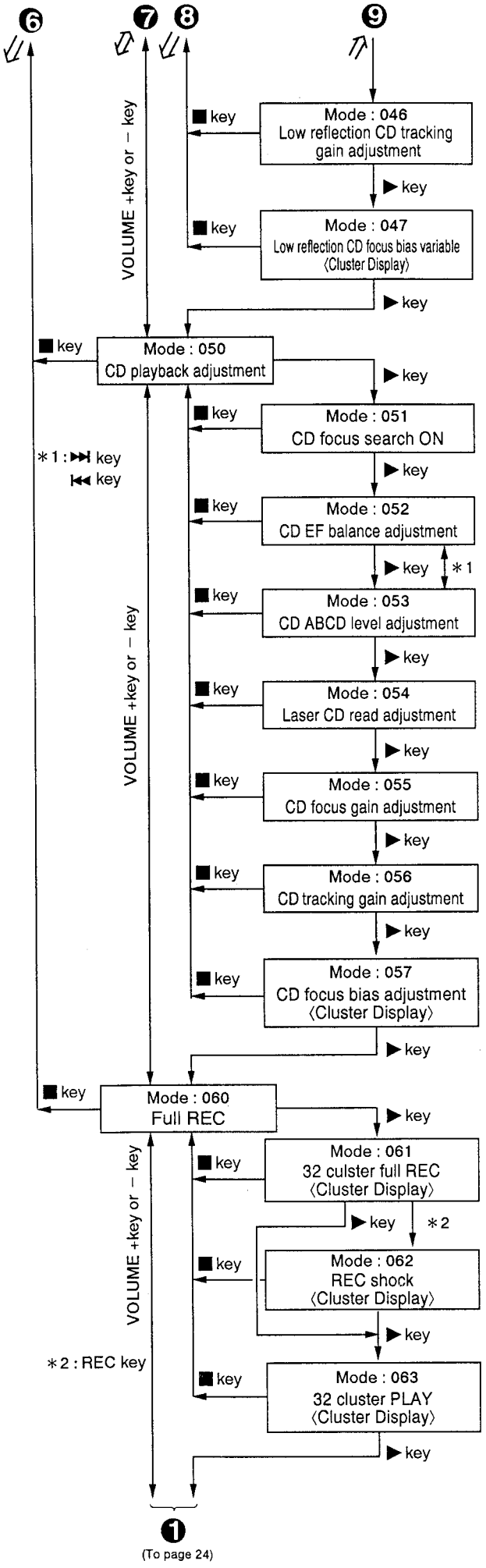
- In modes other than the general adjustment mode, the last two digits of the mode number will be displayed at the 00 section.

[Servo Mode]

- Set the test mode, press the ⏭ key, and set the servo mode using the VOLUME + and − keys.
- When the servo mode is set, the optical pickup will move to the outer circumference or inner circumference if the ⏭ key or ⏮ key is pressed.
- To set other modes, refer to "Structure of Test Mode".

- **Structure of Servo Mode**

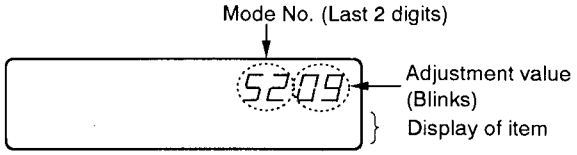




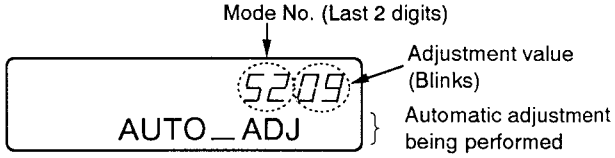
• Adjusting Method

Note : There is basically no display for individual adjustment items. Only such upper position titles as SERVO, AUDIO, etc. (100s position) are displayed.

1. When the adjustment modes are set according to "Structure of Servo Mode", the last two digits of the mode number and the adjustment value written in the EEPROM will be displayed blinking.

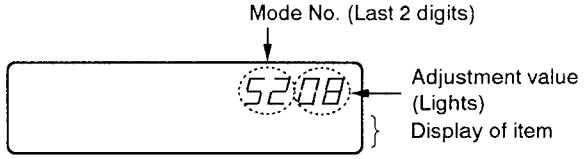


2. When the ▮▮ key is pressed, the following will be displayed and adjustments will be performed automatically.

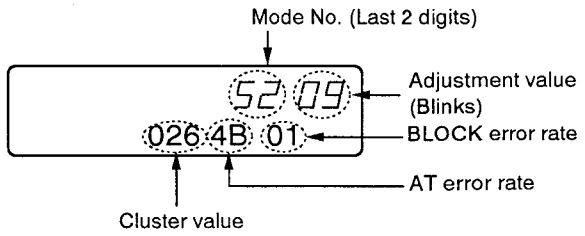


Note : The adjustment value can be changed as desired using the VOLUME + and − keys, but try to avoid this as much as possible.

3. After the adjustments are completed, the item is displayed again and the adjustment value that was blinking lights up.



• Cluster display

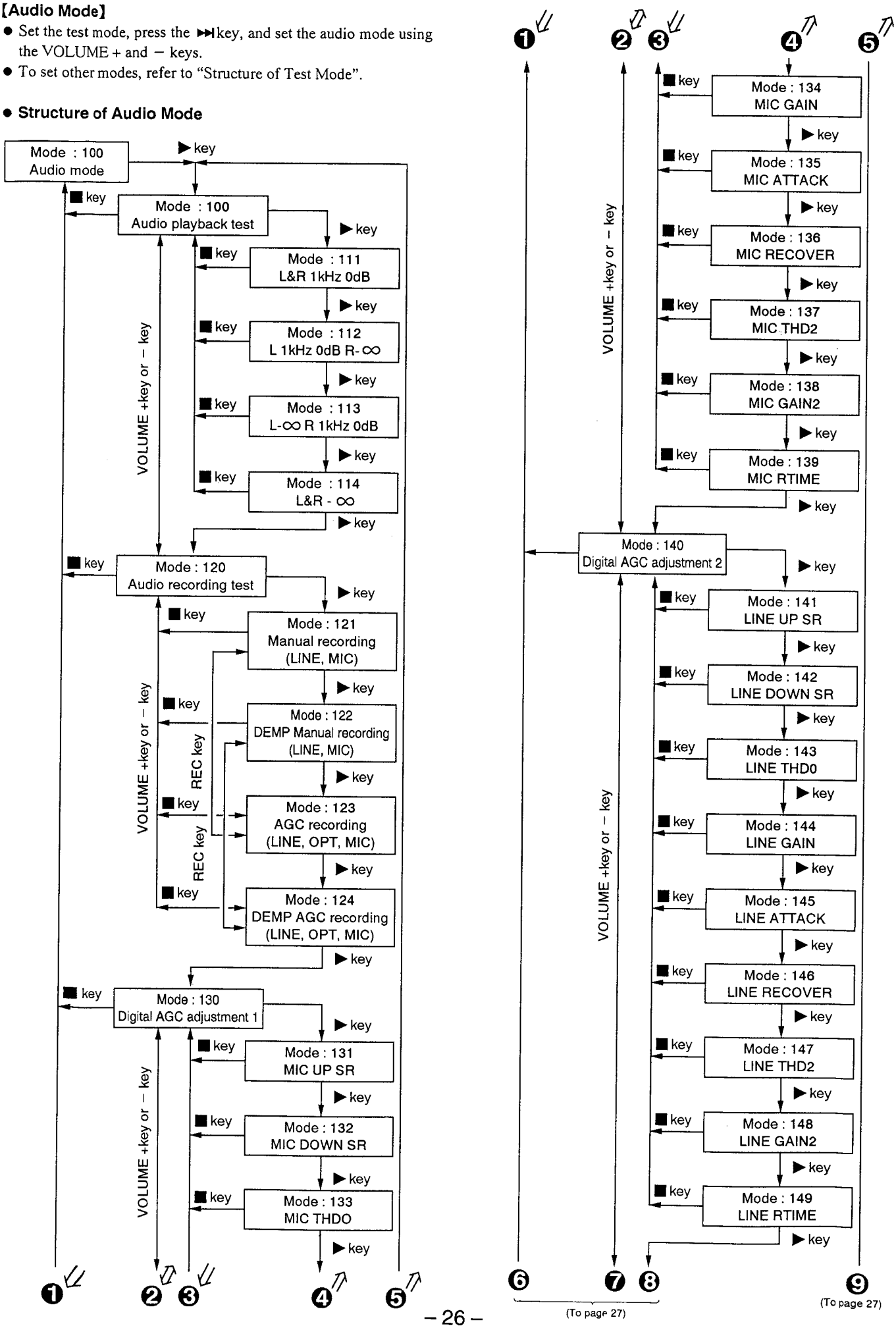


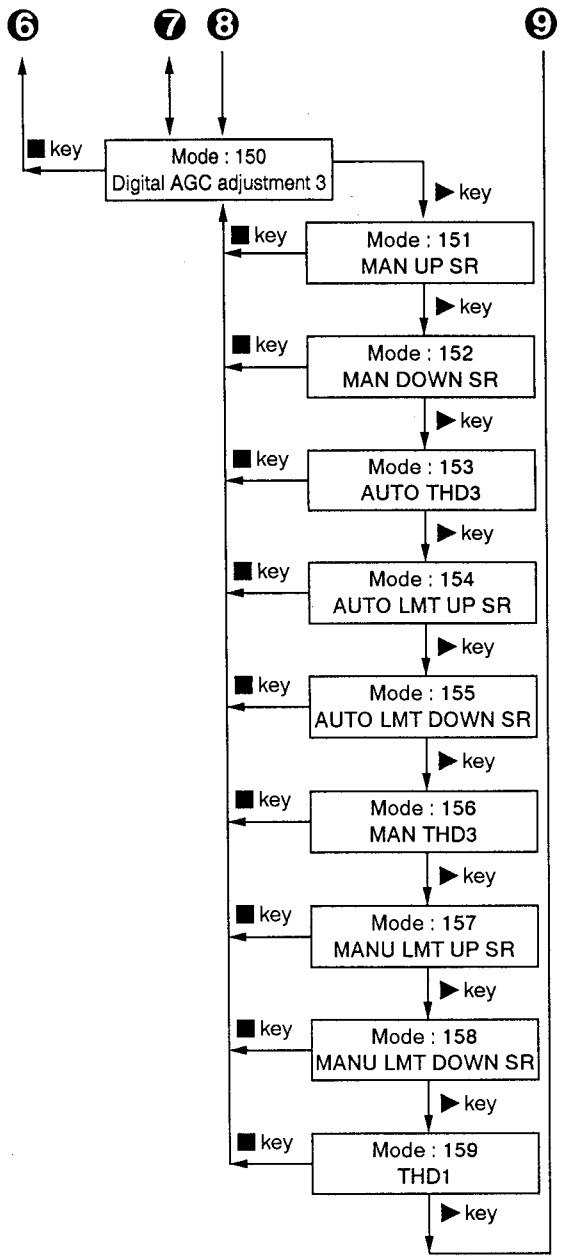
- Nothing is performed at mode numbers 070 to 073.

【Audio Mode】

- Set the test mode, press the ▶▶| key, and set the audio mode using the VOLUME + and − keys.
- To set other modes, refer to "Structure of Test Mode".

- **Structure of Audio Mode**



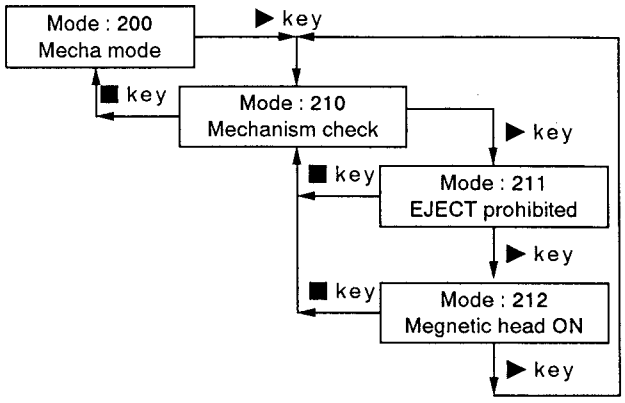


- When the ❚❚ key is pressed at mode numbers 100, 110 to 114, the buzzer will sound.
- When the VOLUME keys + and − are pressed at mode numbers 111 to 113, 123, 124, the volume of the headphone output will increase/decrease.
  When the ⏮ key or ⏭ key is pressed, the volume of the headphone output will become maximum/minimum.
- When the VOLUME keys + and − are pressed at mode numbers 121 or 122, the recording level will increase/decrease.
  When the ⏮ key or ⏭ key is pressed, the recording level will become maximum/minimum.
- At mode numbers 121 to 124, the recording LED will light up.
- At mode numbers 121 to 124, the microprocessor will detect the port and automatically determine the input.

[Mecha Mode]

- Set the test mode, press the ⏭ key, and set the mecha mode using the VOLUME + and − keys.
- To set other modes, refer to "Structure of Test Mode".

● Structure of Mecha Mode

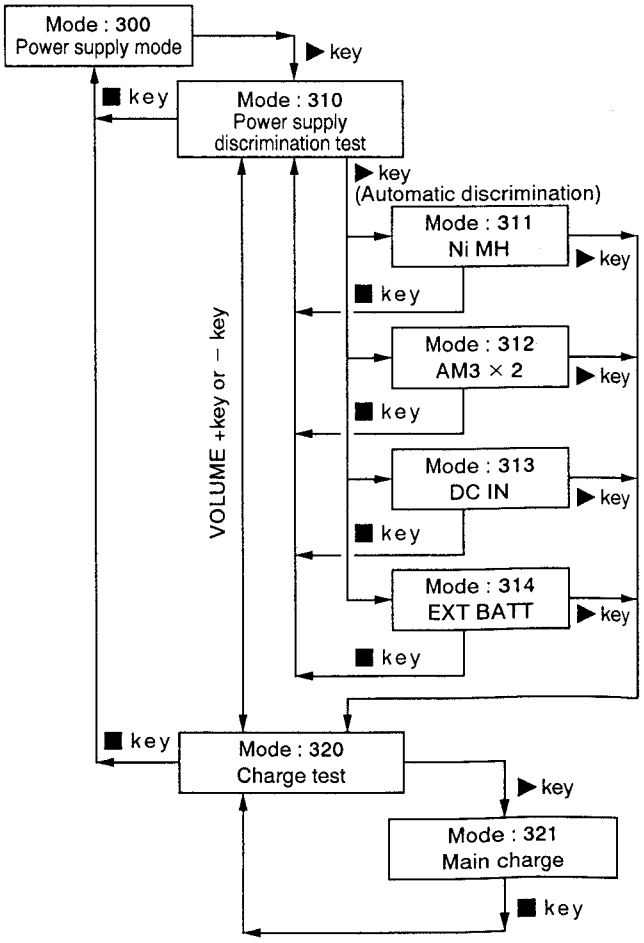


- At mode mumbers 200, 210 to 212, the optical pick up can be moved to the outer circumference or inner circumference using the ⏮ or ⏭ key.

[Power Supply Mode]

- Set the test mode, press the ⏭ key, and set the power supply mode using the VOLUME + and − keys.
- To set other modes, refer to "Structure of Test Mode".

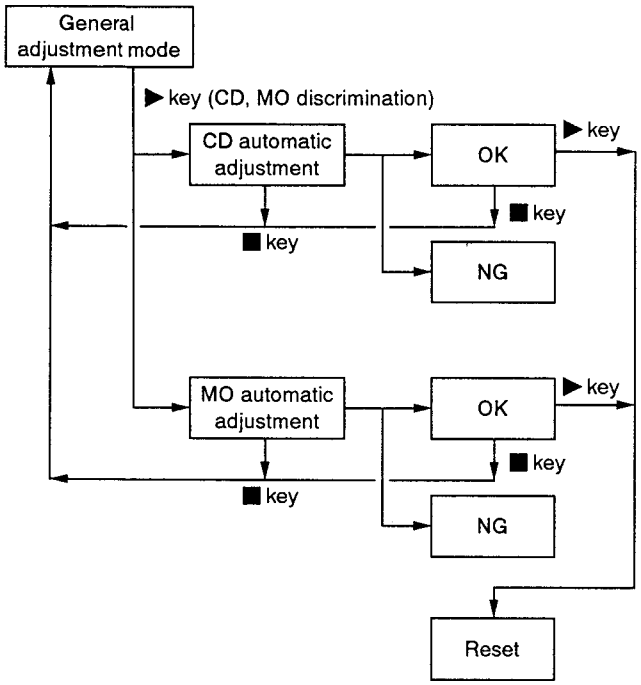
● Structure of Power Supply Mode



[General Adjustment Mode]

- Set the test mode, press the ⏮ key, and set the general adjustment mode.
- To set other modes, cut off the power once and power on again.
- When the general adjustment mode is set, the LCD display will be as follows.

- **Structure of General Adjustment Mode**



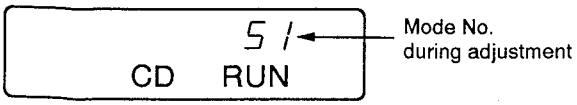
Adjusting Method :

1. Set the test mode, press the ⏮ key to set the general adjustment mode.
2. Load the CD test disc (TDYS-1) or SONY MO disc available on the market.
3. When the ▶ key is pressed, the disc is determined if CD or MO, the automatic adjustment modes are set, and adjustments are performed automatically in the following order.

- CD Automatic Adjustment

No.	Mode No.	Adjustment
1	052	CD EF balance adjustment
2	053	CD ABCD level adjustment
3	055	CD focus gain adjustment
4	056	CD tracking gain adjustment
5	057	CD focus bias adjustment

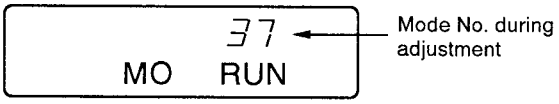
* Display during CD automatic adjustment



- MO Automatic Adjustment

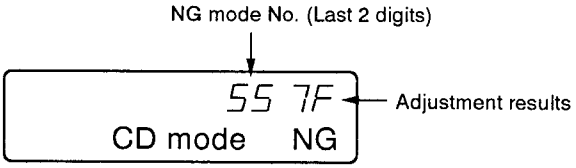
No.	Mode No.	Adjustment
1	032	MO playback EF balance adjustment
2	033	MO playback ABCD level adjustment
3	034	MO recording EF balance adjustment
4	035	MO recotding ABCD level adjustment
5	037	MO focus gain adjustment
6	038	MO tracking gain adjustment
7	061	32 cluster full REC
8	062	REC shock
9	063	32 cluster PLAY
10	039	MO focus bias adjustment
11	042	Low reflection CD EF balance adjustment
12	043	Low reflection CD ABCD level adjustment
13	045	Laser low reflection CD read adjustment
14	046	Low reflection CD tracking gain adjustment

* Display during Mo automatic adjustment

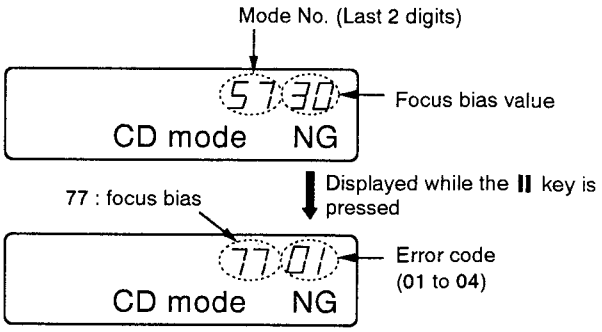


4. If the automatic adjustment results are OK, the following will be displayed.

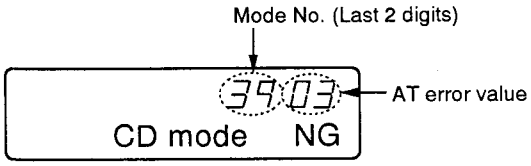
5. If the automatic adjustment results are NG, the following will be displayed.



* When the mode number is 039, 057 and the focus bias value is NG, the following will be displayed.



* When the mode number is 039, 061 and the AT error rate is NG, the following will be displayed.



* When NG, set the servo mode and perform the automatic adjustmen of the NG item. (Refer to "Servo Mode")

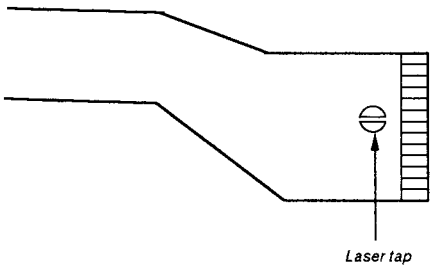
SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. Precautions for Laser Diode Emission Check

When checking the emission of the laser diode during adjustments, never view directly downwards as this may lead to blindness.

5-2. Precautions for Using Optical Pickup (KMS-250A/J2N)

As the laser diode inside the optical pickup damages by static electricity easily, solder the laser tap of the flexible board when handling. Also take the necessary measures to prevent damages by static electricity. Handle the flexible board with care as it breaks easily



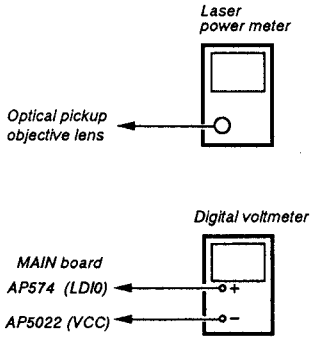
Optical pickup flexible board

5-3. Precautions for Adjustment

1) Perform all adjustments in the order given in the test mode. After adjusting, exit the test mode.
2) Use the following tools and measuring instruments.
   - CD test disc TDYS-1 (Parts Code : 4-963-646-01)
   - Recorded MO disc PTDM-1 (Parts Code : J-2501-054-A)
   - Laser power meter LPM-1 (Parts Code : J-2501-046-A)
   - Oscilloscope (Frequency band above 40MHz. Perform the calibration of probe first before measuring.)
   - Digital voltmeter
3) Unless specified othewise, supply DC 6V from the DC IN 6V jack.
4) Swtich, knob positions
   Hold switch····· OFF
   AVLS switch ····· OFF

5-4. Laser Power Check

Connection :

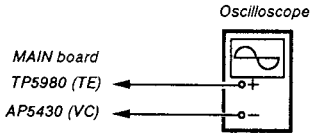


Adjusting Method :

1. Set the servo mode of the test mode (Mode : 000).
2. Press the ▶ key, and set the laser power adjustment mode (Mode : 020) using the volume + and − keys.
3. Press the ⏮ key and move the optical pickup to the inner most circumference
4. Open the cover and set the laser power meter on the objective lens of the optical pickup.
5. Press the ▶ key, and set the laser MO read adjustment mode (Mode : 021).
6. Check that the laser power meter reading is 0.85 ± 0.085mW.
7. Check that the voltage between AP574 (LDI0) and AP5022 (VCC) at this time is below 44mV.
8. Press the ▶ key, and set the laser MO write adjustment mode (Mode : 022).
9. Check that the laser power meter reading is 6.8 ± 0.68mW.
10. Press the ⏸ key to finalize the adjustment data.
11. Check that the voltage between AP574 (LDI0) and AP5022 (VCC) at this time is below 88mV.
12. Press the ■ key.
13. Exit the test mode.

5-5. MO Traverse Adjustment

Connection :



Adjusting Method :

1. Set the servo mode of the test mode (Mode : 000).
2. Press the ▶ key, and set the MO playback adjustment mode (Mode : 030) using the volume + and − keys.
3. Press the ⏮ and ⏭ keys and move the optical pickup to the center circumference.
4. Load any MO disc available on the market.
5. When the ▶ key is pressed, the MO playback EF balance adjustment mode (Mode : 032) will be set after focus search ON (Mode : 031).
6. Press the ⏸ key to perform automatic adjustment, and check that the traverse waveform is symmetrical at the top and bottom.
7. Slide the recording key and set the MO recording EF balance adjustment mode (Mode : 034).
8. Press the ⏸ key to perform automatic adjustment, and check that the traverse waveform is symmetrical at the top and bottom.

(Traverse Waveform)

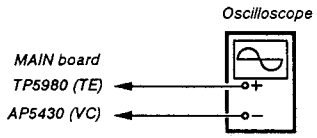
Specification : A=B, C ≧ 1.0Vp-p

9. Check that the traverse level at this time is above 1.0Vp-p.
10. Press the ■ key.
11. Exit the test mode.

Note : Using a recorded disc in this adjustment will erase the data.

5-6. Low Reflection CD Traverse Adjustment

Connection :



Adjusting Method :

1. Set the servo mode of the test mode (Mode : 000).
2. Press the ▶ key, and set the low reflection CD playback adjustment mode (Mode : 040) using the volume + and − keys.
3. Load any MO disc available on the market.
4. When the ▶ key is pressed, the low reflection CD playback EF balance adjustment mode (Mode : 042) will be set after low reflection CD focus search ON (Mode : 041).
5. Press the ❚❚ key to perform automatic adjustment, and check that the traverse waveform is symmetrical at the top and bottom.

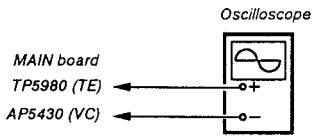
(Traverse Waveform)

Specification : A=B, C ≧ 0.9Vp-p

6. Check that the traverse level at this time is above 0.9Vp-p.
7. Press the ■ key.
8. Exit the test mode.

5-7. CD Traverse Adjustment

Connection :



Adjusting Method :

1. Set the servo mode of the test mode (Mode : 000).
2. Press the ▶ key, and set the CD playback adjustment mode (Mode : 050) using the volume + and − keys.
3. Press the ⏮ and ⏭ keys and move the optical pickup to the center circumference.
4. Load a CD test disc (TDYS-1).
5. When the ▶ key is pressed, the CD playback EF balance adjustment mode (Mode : 052) will be set after CD focus search ON (Mode : 051).
6. Press the ❚❚ key to perform automatic adjustment, and check that the traverse waveform is symmetrical at the top and bottom.

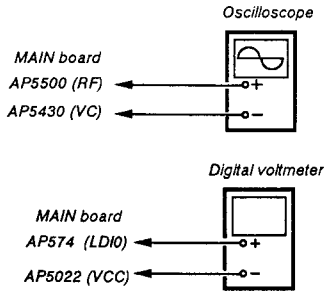
(Traverse Waveform)

Specification : A=B, C ≧ 1.0Vp-p

7. Check that the traverse level at this time is above 1.0Vp-p.
8. Press the ■ key.
9. Exit the test mode.

5-8. CD RF Level Check

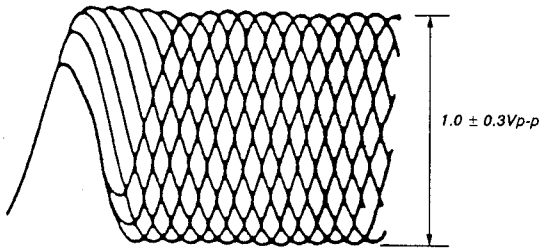
Connection :



Adjusting Method :

1. Set the servo mode of the test mode (Mode : 000).
2. Press the ▶ key, and set the CD playback adjustment mode (Mode : 050) using the volume + and − keys.
3. Press the ⏮ and ⏭ keys and move the optical pickup to the center circumference.
4. Load a CD test disc (TDYS-1).
5. When the ▶ key is pressed, the CD EF balance adjustment mode (Mode : 052) will be set after CD focus search ON (Mode : 051).
6. When the ▶ key is pressed, the ABCD level adjustment mode (Mode : 053) is set.
7. Press the ⏸ key to perform automatic adjustment, and check that the RF level is 1.0 ± 0.3Vp-p.

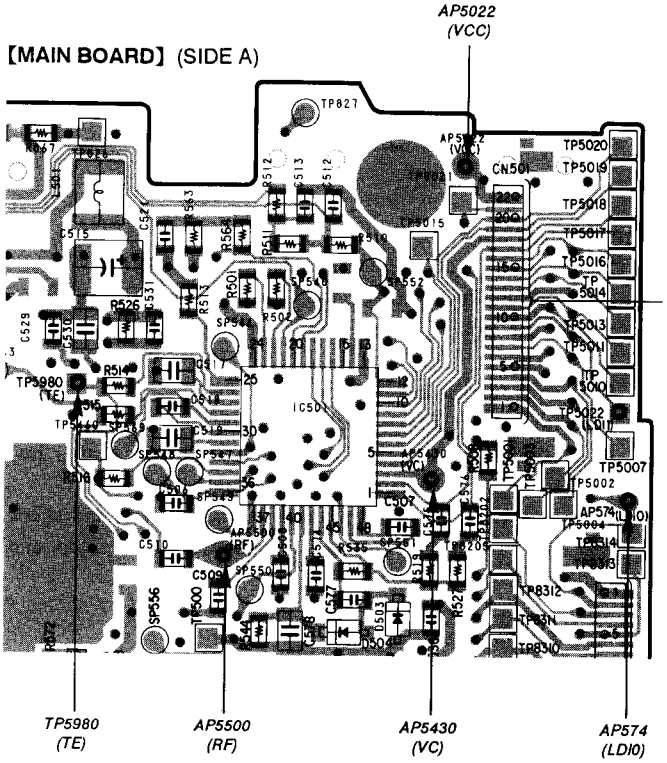
(RF waveform)



8. Check that the voltage between AP574 (LDI0) and AP5022 (VCC) at this time is below 44mV.
9. Press the ■ key.
10. Exit the test mode.

Adjustment Location :

【MAIN BOARD】 (SIDE A)



SECTION 6
EXPLANATION OF IC TERMINALS

IC503 DIGITAL SERVO, ATRAC (CXD2652R)

Pin No.	Pin name	I/O	Description
1	MNT 0	O	Traverse count signal output.
2	MNT 1	O	Track jump detect output.
3	MNT 2	–	Not used (Open).
4	MNT 3	–	Not used (Open).
5	SWDT	I	Inputs write data signal from system controller (IC801).
6	SCLK	I	Inputs serial clock signal from system controller (IC801).
7	XLAT	I	Inputs serial latch signal from system controller (IC801).
8	SRDT	O	Outputs write data signal to system controller (IC801).
9	SENS	O	Outputs internal status (SENSE) to system controller (IC801).
10	XRST	I	Inputs reset signal from system controller (IC801). Reset : L
11	SQSY	O	Output subcode Q sync (SCOR) to system controller (IC801). Outputs "L" every 13.3msec. Outputs "H" at all most mostly.
12	DQSY	O	Outputs digital-in U-bit CD format subcode Q sync (SCOR) to system controller (IC801). Outputs "L" every 13.3msec. Outputs "H" at all most mostly.
13	WRPWR	I	Inputs laser power switching signal from system controller (IC801).
14	NC	–	Not used (Open).
15	TX	I	Input of write data taransmission timing from system controller (IC801). Also used as magnetic field head ON/OFF output.
16	OSC1	O	Clock output (45MHz).
17	OSC0	I	Clock input (45MHz).
18	XTSL	–	Not used (Fixed at "L")
19	RV_{DD}	–	Not used (Open).
20	RV_{SS}	–	Connect to ground.
21	DIN	I	Digital audio signal input pin (For optical input).
22	NC	–	Not used (Open).
23	ADDT	I	Audio data input from A/D converter (IC303).
24	DATA	O	Monitor/decode audio data output to A/D converter (IC303).
25	ALRCK	O	L/R clock output to D/A converter (IC303).
26	ABCK	O	Bit clock signal output to A/D, D/A converter (IC303).
27	FS256	O	11.2896MHz clock output (MCLK).
28	DV_{DD}	–	Power supply (+2.8V) for digital.
29 – 32	A03 – A00	O	Address signal output to RAM (IC509).
33	NC	–	Not used (Open).
34 – 38	A04 – A08	O	Address signal output to RAM (IC509).
39	NC	–	Not used (Open).
40	DV_{SS}	–	Ground terminal.
41	XOE	O	Output enable contol signal output to RAM (IC509).
42	XCAS	O	Column address strobe singal output to RAM (IC509).
43	A09	O	Address signal output to RAM (IC509).
44	XRAS	O	Row address strobe signal output to RAM (IC509).
45	XWE	O	Read/write control signal output to RAM (IC509).
46 – 49	D1 – D3	I	Data signal input from RAM (IC509).
50	MVCI	–	Not used (Connect to ground).
51	ASYO	O	Playback EFM full-swing output (L : VSS, H : VDD).
52	ASYI	I	Playback EFM asymmetry comparate voltage input.

Pin No.	Pin name	I/O	Description
53	AV_{DD}	–	Power supply (+2.8V) for analog.
54	BIAS	I	Playback EFM asymmetry circuit constant current input.
55	RFI	I	Inputs playback EFM RF signal from RF amplifier (IC501).
56	AV_{SS}	–	Ground terminal.
57	PDO	–	Not used (Open).
58	PCO	O	Decoder PLL master clock PLL phase comparison output.
59	FILI	I	Decoder PLL master clock PLL filter input.
60	FILO	O	Decoder PLL master clock PLL filter output.
61	CLTV	I	Decoder PLL master clock PLL VCO control voltage input.
62	PEAK	I	Inputs peak hold signal for light amount signal from RF amplifier (IC501).
63	BOTM	I	Inputs bottom hold signal for light amount signal from RF amplifier (IC501).
64	ABCD	I	Light amount signal from RF amplifier (IC501).
65	FE	I	Input focus error signal from RF amplifier (IC501).
66	AUX1	I	Input of auxiliary signal from RF amplifier (IC501).
67	VC	I	Input of middle point voltage (+1.4V) from RF amplifier (IC501).
68	ADIO	–	Not used (Open).
69	AV_{DD}	–	Power supply (+2.8V) for analog.
70	ADRT	–	Not used (Connect to +2.8V).
71	ADRB	–	Not used (Open).
72	AV_{SS}	–	Ground terminal.
73	SE	I	Input of sled error signal from RF amplifier (IC501).
74	TE	I	Input of tracking error signal from RF amplifier (IC501).
75	AUX2	–	Not used (Open).
76	DCHG	–	Not used (Connect to +2.8V).
77	APC	–	Not used (Connect to +2.8V).
78	ADFG	I	Input of ADIP dual FM signal from RF amplifier (IC501) (22.05kHz ± 1kHz). (TTL Schmidt input)
79	FO CONT	O	Focus control output to RF amplifier (IC501).
80	XLRF	I	Latch signal input from RF amplifier (IC501).
81	CKRF	O	RFCK clock (7.35kHz) signal output.
82	DTRF	I	Serial data input from system controller (IC801).
83	APCREF	I	Laser power setting signal input.
84	LDDR	–	Not used (Open).
85	TRDR	O	Tracking servo drive signal output (−).
86	TFDR	O	Tracking servo drive signal output (+).
87	DVDD	–	Power supply (+2.8V) for digital.
88	FFDR	O	Focus servo drive signal output (+).
89	FRDR	O	Focus servo drive signal output (−).
90	FS4	O	176.4kHz clock signal output (MCLK).
91	SRDR	O	Sled servo drive signal output (−).
92	SFDR	O	Sled servo drive signal output (+).
93	SPRD	O	Spindle servo drive signal output (−).
94	SPFD	O	Spindle servo drive signal output (+).
95	FGIN	I	FG signal input from spindle motor driver (IC701).
96	TEST1	–	Not used (Connect to +2.8V).
97	TEST2	–	Not used (Connect to +2.8V).
98	TEST3	–	Not used (Connect to +2.8V).
99	DV_{SS}	–	Ground terminal.
100	EFMO	O	EFM recording signal ouput.

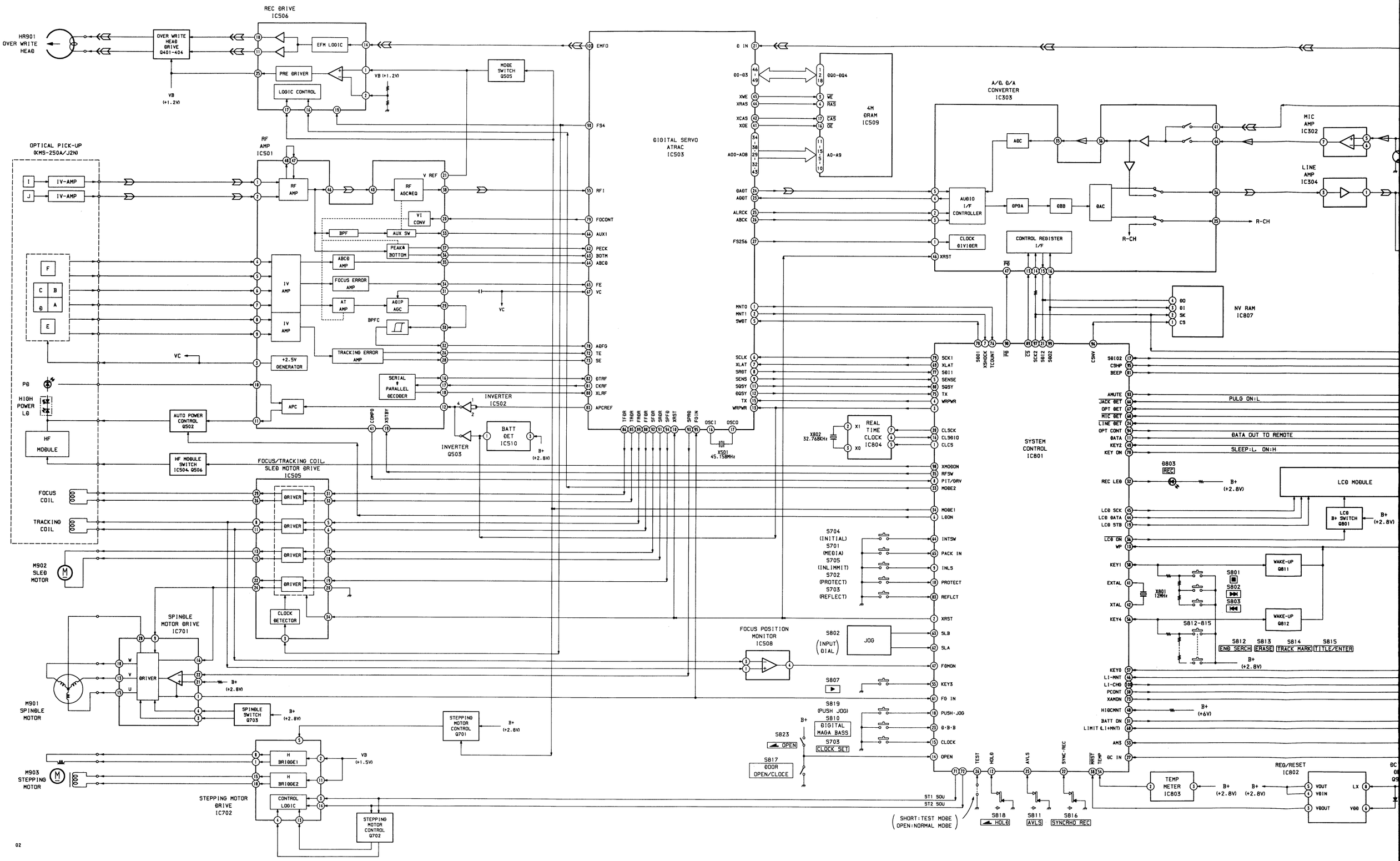
IC801 SYSTEM CONTROL (CXP81960M-632R)

Pin No.	Pin name	I/O	Description
1	CLCS	O	Chip select output to real time clock (IC804).
2	XRST	O	Reset output. L : Reset
3	WRPWR	–	Laser power switching signal output.
4	TX	O	Write data transfer timing output.
5	SENSE	I	Internal status (SENSE) input.
6	LDON	O	Laser ON signal. H : ON
7	XSHOCK	I	Track jump detection input.
8	PIT/GRV	I	COMP signal input from RF amplifier (IC501).
9	INLS	I	Detecting switch for internal circuit of sleding. Internal circuit : L
10	PROTECT	I	Disc write protect switch. H : Protect
11	DATA	O	Data output to remote control.
12	HOLD	I	Hold switch input (This unit). L : Hold
13	WP	I	Wake-up signal input from remote control key and this unit key.
14	OPEN	I	Detecting switch for opening and closing of the upper cover. Close : L
15	CLOCK	I	CLOCK SET switch input.
16	CLSDIO	I	Serial clock input.
17	SDIO2	I/O	Serial data input/output.
18	PUSH JOG	I	Push JOG switch input.
19	LCD STB	O	LCD standby ouput.
20	CLSCK	O	Serial clock output for real time clock (IC804).
21	SDI2	I	Serial data input.
22	SYNC. REC	I	SYNCHRO REC switch input.
23	D. B. B	I	DIGITAL MEGA BASS switch input.
24	$\overline{\text{LINEDET}}$	I	Line input detect. L : Line
25	AVLS	I	AVLS switch input. L : ON
26	TEST	I	Test mode terminal. L : Test mode
27	$\overline{\text{DCIN}}$	I	DC input detect. L : DC IN
28	KANASE L	–	Not used (Connect toground).
29	——	–	Not used (Open).
30	$\overline{\text{PCONT}}$	O	Power control output. L : ON
31	$\overline{\text{BATTON}}$	O	Outputs L while operating with a battery.
32	RECLED	O	REC LED control. L : ON
33	MODE2	O	Head drive (IC506) control signal output.
34	MODE1	O	
35	RFSW	O	Power control output to RF amplifier (IC501).
36	$\overline{\text{LCD ON}}$	O	LCD ON/OFF control. L : ON
37	MP	–	Microprocessor mode input (Fixed at "L").
38	$\overline{\text{MRST}}$	I	Microprocessor reset input.
39	V_{SS}	–	Ground.
40	XTAL	–	System clock (12MHz).
41	EXTAL	–	System clock (12MHz).
42	CS	–	Chip Select input (Connected to +2.8V).
43	——	–	Not used (Fixed at "L").
44	LCDDATA	O	LCD data output.
45	LCDSCK	O	Serial clock output.
46	LI-MNT	I	Voltage monitor for lithium battery.
47	FDMON	I	Focus coil position monitor input.
48	HIDCMNT	I	Voltage monitor DC input.
49	KEY2	I	Remote control key input.
50	AV_{SS}	–	A/D converter ground terminal.

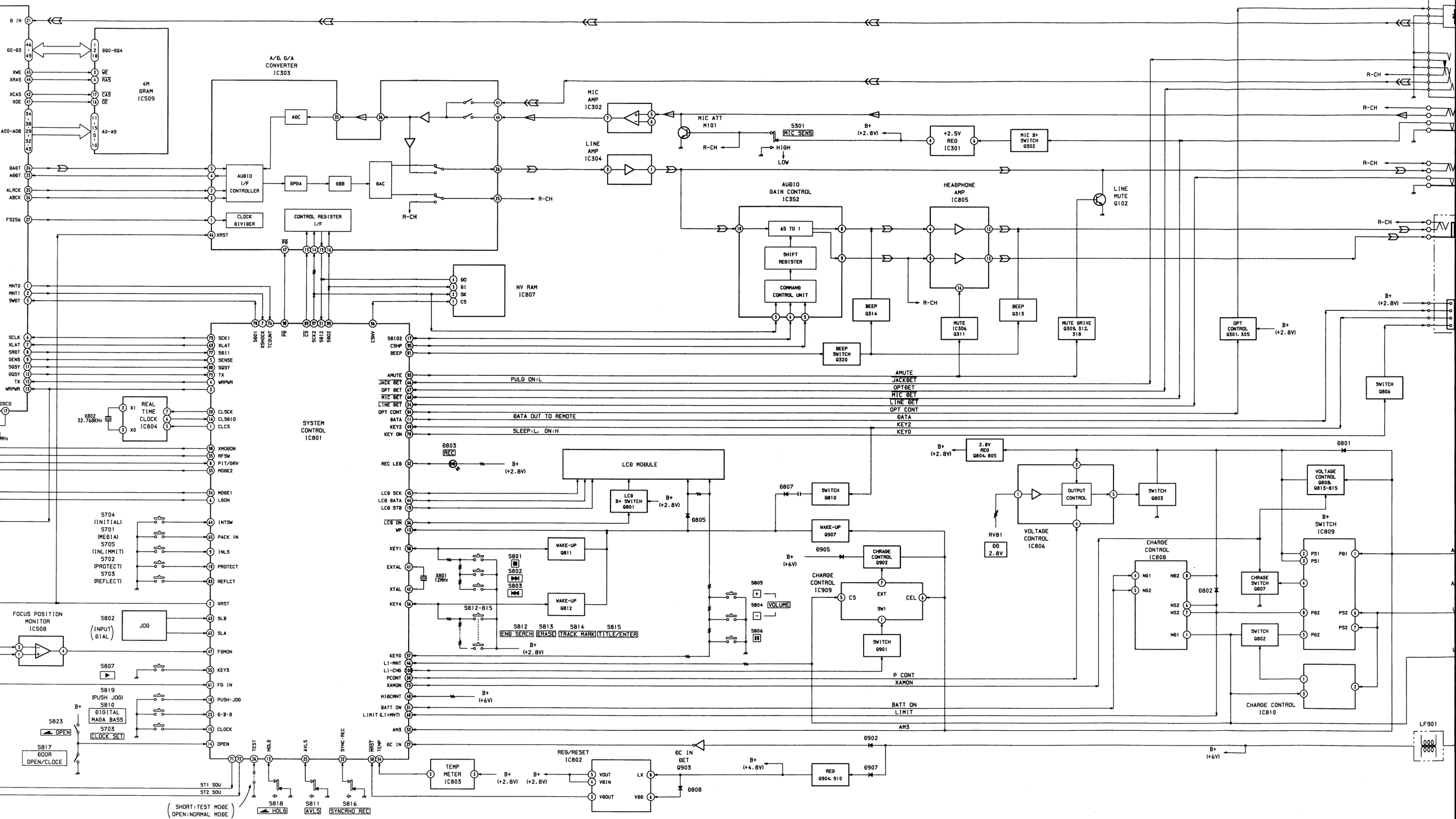
Pin No.	Pin name	I/O	Description
51	AVREF	I	A/D converter reference voltage input.
52	AV_{DD}	–	A/D converter power supply terminal.
53	AM3	I	AC adaptor or EXT battery detection input. L : EXT battery
54	TEMP	I	Temp meter (IC803) input.
55	KEY3	I	PLAY Key input.
56	KEY4	I	Key input.
57	KEY0	I	Key input.
58	KEY1	I	Key input.
59	UNMNT (LI+MNT)	I	UNREG voltage monitor.
60	LIMIT (LI+MNT)	I	Voltage monitor for lithium battery.
61	FGIN	I	FG input from motor driver (IC701).
62	SLA	I	JOG dial signal input.
63	SLB	I	
64	INTSW	I	INITIAL switch input.
65	PACK IN	I	MEDIA switch input.
66	$\overline{\text{JACKDET}}$	I	Input jack detection input.
67	OPT DET	I	Detecting input an optical input.
68	MICDET	I	MIC jack detection.
69	XLAT	O	Latch output.
70	KEYON	O	TRACK MARK jack input.
71	ST1SOU	O	Stepping motor signal output.
72	ST2SOU	O	
73	XAMON	O	Charge current control.
74	——	–	Not used (Open).
75	DQSY	I	Subcode Q sync (SCOR) of digital in U-bit CD format from IC503.
76	TCOUNT	I	Traverse count signal input.
77	SDI1	I	Serial data input.
78	SDO1	O	Serial data output.
79	SCK1	O	Serial clock output.
80	SQSY	I	SUB-Q/ADIP SYNC input.
81	BEEP	O	BEEP sound output control. H : BEEP sound output
82	——	–	Not used (Open).
83	REFLCT	I	CD/MO discrimination switch.
84	TEX	–	Not used (Fixed at "L")
85	XT	–	Not used (Open).
86	V_{SS}	–	Ground.
87	V_{DD}	–	Power supply pin (+2.8V).
88	NC	–	Not used (Fixed at "H")
89	$\overline{\text{CS}}$	I	Chip select input.
90	$\overline{\text{PD}}$	O	D/A converter power down detect during recording. H : Power down
91	——	–	Not used (Open).
92	——	–	Not used (Open).
93	AMUTE	O	Analog mute control. L : Mute
94	OPTCONT	O	Power supply control output for an optical input.
95	CSHP	O	Chip select output.
96	CSNV	O	
97	SCK2	O	Serial clock output.
98	XMODON	O	HF module control output.
99	SDO2	O	Serial data output.
100	LI-CHG	O	Charge control. H : Charge

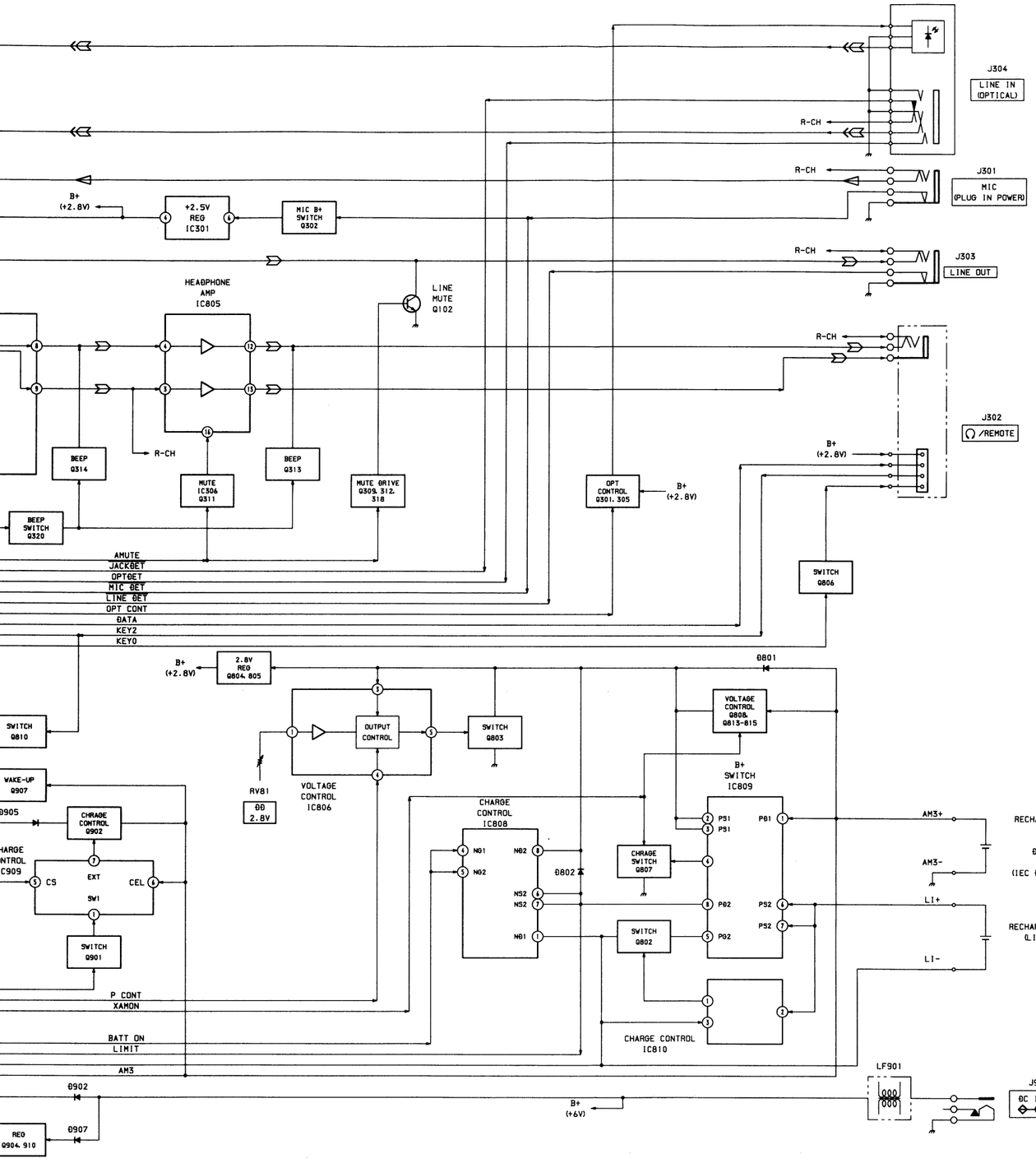
SECTION 7
DIAGRAMS

7-1. BIOCK DIAGRAM



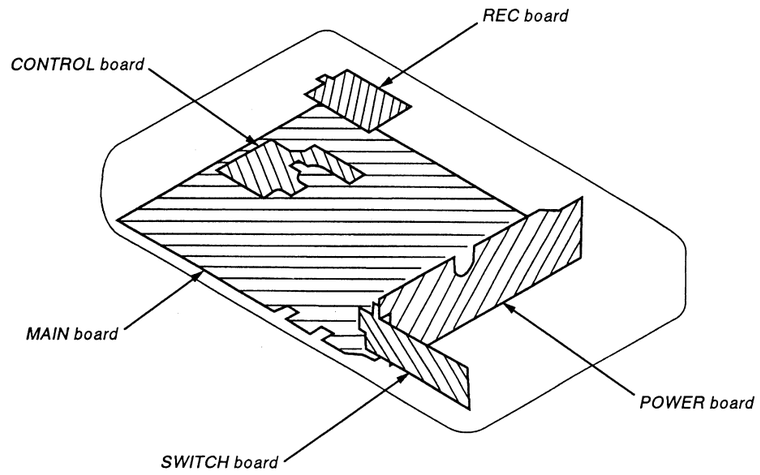
02


A/D, D/A CONVERTER IC303
4M DRAM IC509
AUDIO I/F CONTROLLER
CLOCK DIVIDER
CONTROL REGISTER I/F
MIC AMP IC302
LINE AMP IC304
MIC ATT M101
S301 MIC SENS
HIGH
LOW
+2.5V REG IC301
MIC B+ SWITCH Q302
AUDIO GAIN CONTROL IC352
65 TO 1
SHIFT REGISTER
COMMAND CONTROL UNIT
HEADPHONE AMP IC805
LINE MUTE Q102
BEEP Q314
BEEP Q313
MUTE IC306 Q311
MUTE DRIVE Q309, 312, 318
OPT CONTROL Q301, 305
NV RAM IC807
SYSTEM CONTROL IC801
REAL TIME CLOCK IC804
X802 32.768KHz
S704 (INITIAL) S701 (MEDIA) S705 (INLIMMIT) S702 (PROTECT) S703 (REFLECT)
FOCUS POSITION MONITOR IC508
S802 (INPUT DIAL) JOG
S807
S819 (PUSH JOG)
S810 DIGITAL MAGA BASS
S703 CLOCK SET
S823 OPEN
S817 DOOR OPEN/CLOCE
ST1 SOU
ST2 SOU
SHORT:TEST MODE
OPEN:NORMAL MODE
S818 HOLD
S811 AVLS
S816 SYNCRHO REC
PULG ON:L
DATA OUT TO REMOTE
SLEEP:L, ON:H
LCD MODULE
LCD B+ SWITCH Q801
WAKE-UP Q811
WAKE-UP Q812
S801
S802
S803
S805
S804 VOLUME
S806
S812-815
S812 END SERCH
S813 ERASE
S814 TRACK MARK
S815 TITLE/ENTER
X801 12MHz
REG/RESET IC802
TEMP METER IC803
DC IN DET Q903
REG Q904, 910
SWITCH Q810
SWITCH Q803
WAKE-UP Q907
CHRAGE CONTROL Q902
CHARGE CONTROL IC909
SWITCH Q901
2.8V REG Q804, 805
OUTPUT CONTROL
VOLTAGE CONTROL IC806
RV81
VOLTAGE CONTROL Q808, Q813-815
B+ SWITCH IC809
CHARGE CONTROL IC808
CHRAGE SWITCH Q807
SWITCH Q802
CHARGE CONTROL IC810
SWITCH Q806
LF901
R-CH
B+ (+2.8V)
B+ (+6V)
B+ (+4.8V)



• Signal path.
: PB
: REC
: MIC

7-2. CIRCUIT BOARDS LOCATION



7-3. PRINTED WIRING BOARDS – MAIN SECTION –

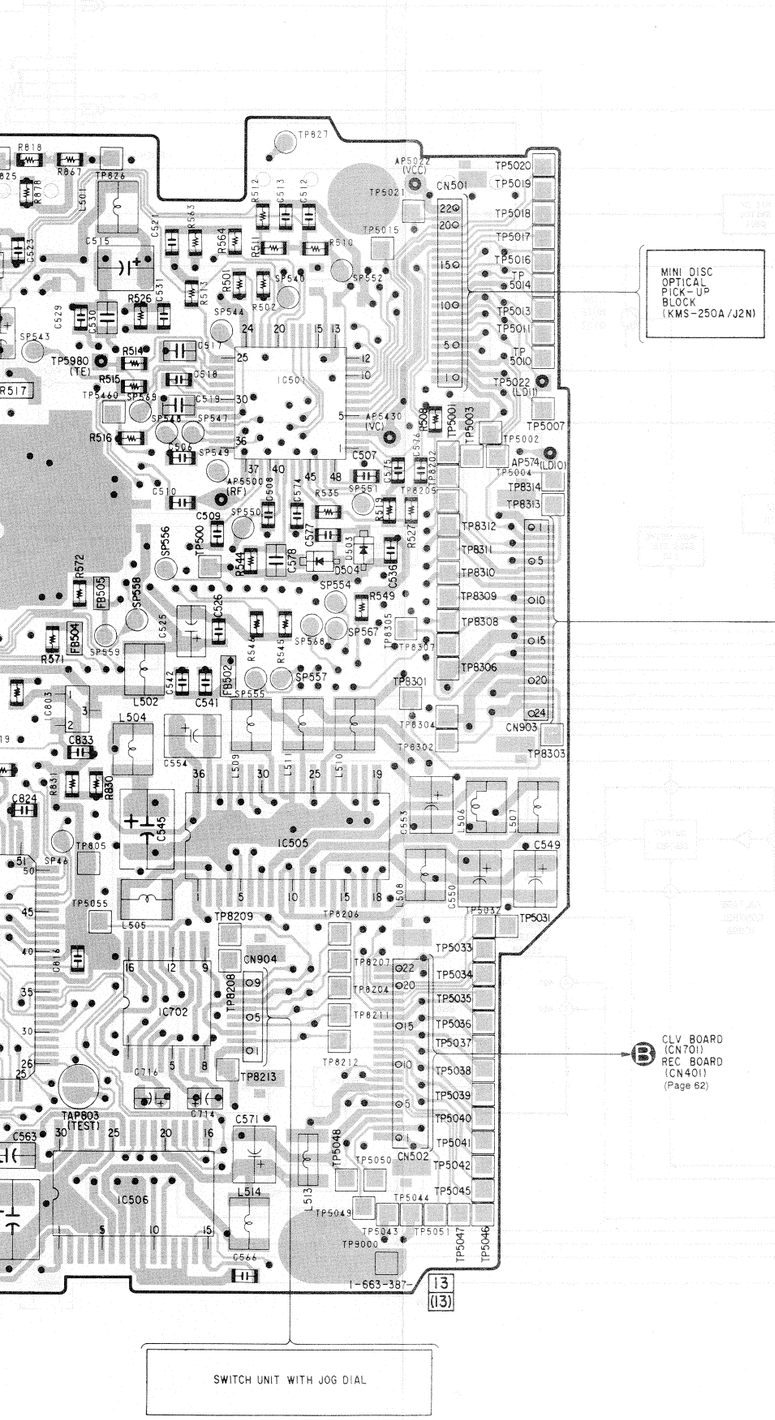
• SEMICONDUCTOR LOCATION

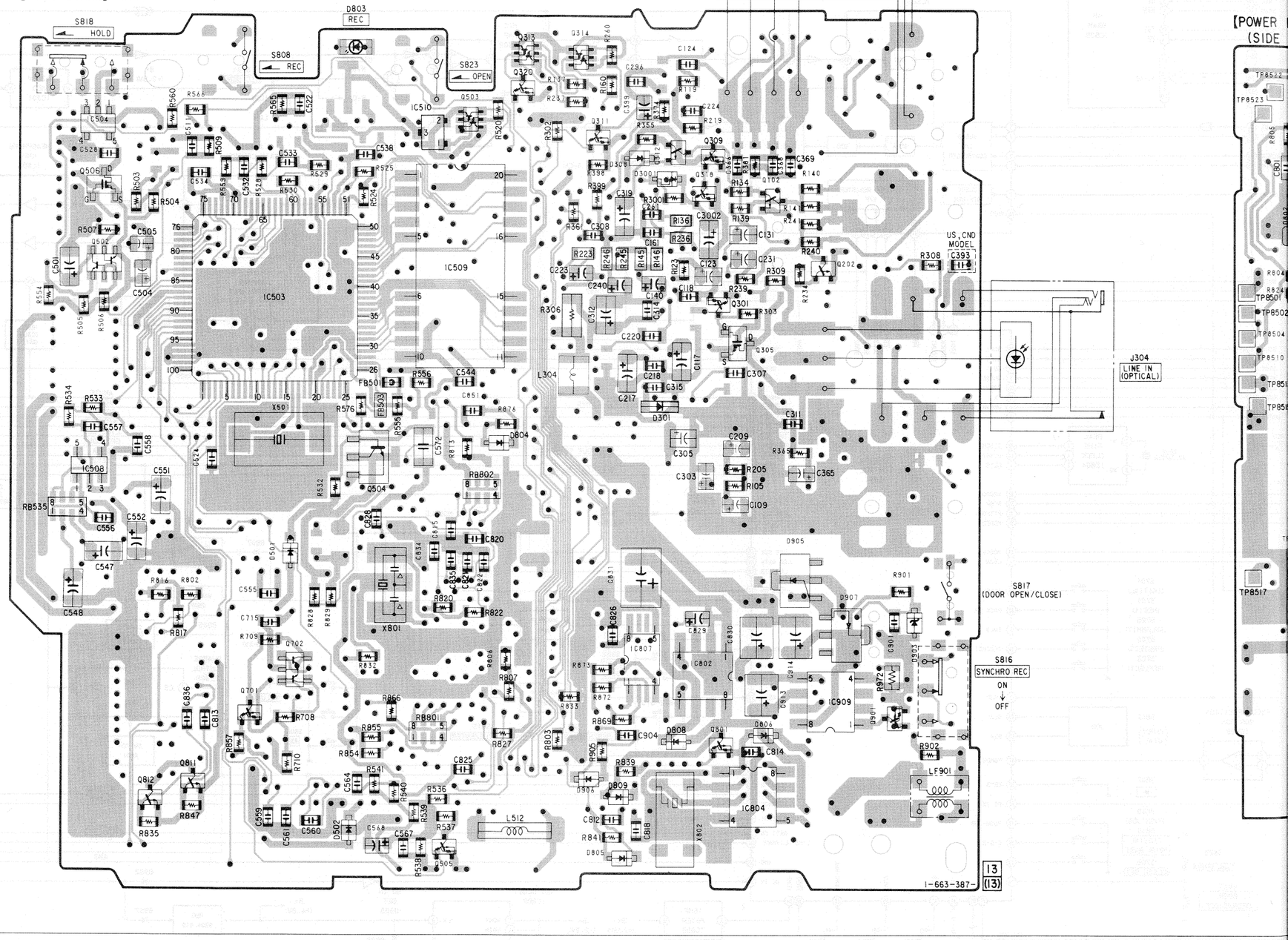
Ref. No.	Location	Ref. No.	Location
D101	B - 3	IC805	B - 4
D201	B - 3	IC806	B - 23
D301	E - 17	IC807	G - 17
D303	C - 4	IC808	E - 23
D304	B - 4	IC809	D - 23
D305	C - 4	IC810	B - 23
D307	B - 3	IC909	G - 19
D308	C - 17		
D310	C - 3		
D501	F - 14	Q101	E - 4
		Q102	C - 18
D502	H - 15	Q201	E - 4
D503	D - 9	Q202	D - 19
D504	D - 8	Q301	D - 18
D801	C - 23		
D802	C - 23	Q302	D - 6
		Q305	D - 18
D803	B - 15	Q309	C - 18
D804	E - 16	Q311	B - 17
D805	I - 17	Q312	C - 17
D806	H - 18		
D807	B - 6	Q313	B - 16
		Q314	B - 17
D808	H - 17	Q318	C - 18
D809	H - 17	Q320	B - 16
D810	F - 26	Q502	D - 13
D812	F - 25		
D902	G - 2	Q503	B - 16
		Q504	E - 15
D903	G - 19	Q505	H - 15
D905	F - 18	Q506	C - 13
D906	H - 17	Q701	G - 14
D907	G - 19		
D3001	C - 17	Q702	G - 14
		Q801	H - 18
		Q802	B - 23
IC301	E - 4	Q803	B - 26
IC302	E - 2	Q804	G - 26
IC303	E - 4		
IC304	D - 5	Q805	F - 26
IC306	C - 5	Q806	C - 6
		Q807	D - 23
IC352	C - 4	Q808	C - 26
IC501	C - 8	Q810	C - 6
IC502	B - 6		
IC503	D - 14	Q811	H - 13
IC504	B - 13	Q812	H - 13
		Q813	C - 27
IC505	F - 8	Q814	B - 27
IC506	H - 7	Q815	C - 26
IC508	E - 12		
IC509	D - 16	Q901	G - 19
IC510	B - 15	Q902	G - 4
		Q903	G - 2
IC702	G - 8	Q904	G - 4
IC801	G - 6	Q907	H - 5
IC802	G - 18		
IC803	E - 7	Q910	F - 3
IC804	H - 18		

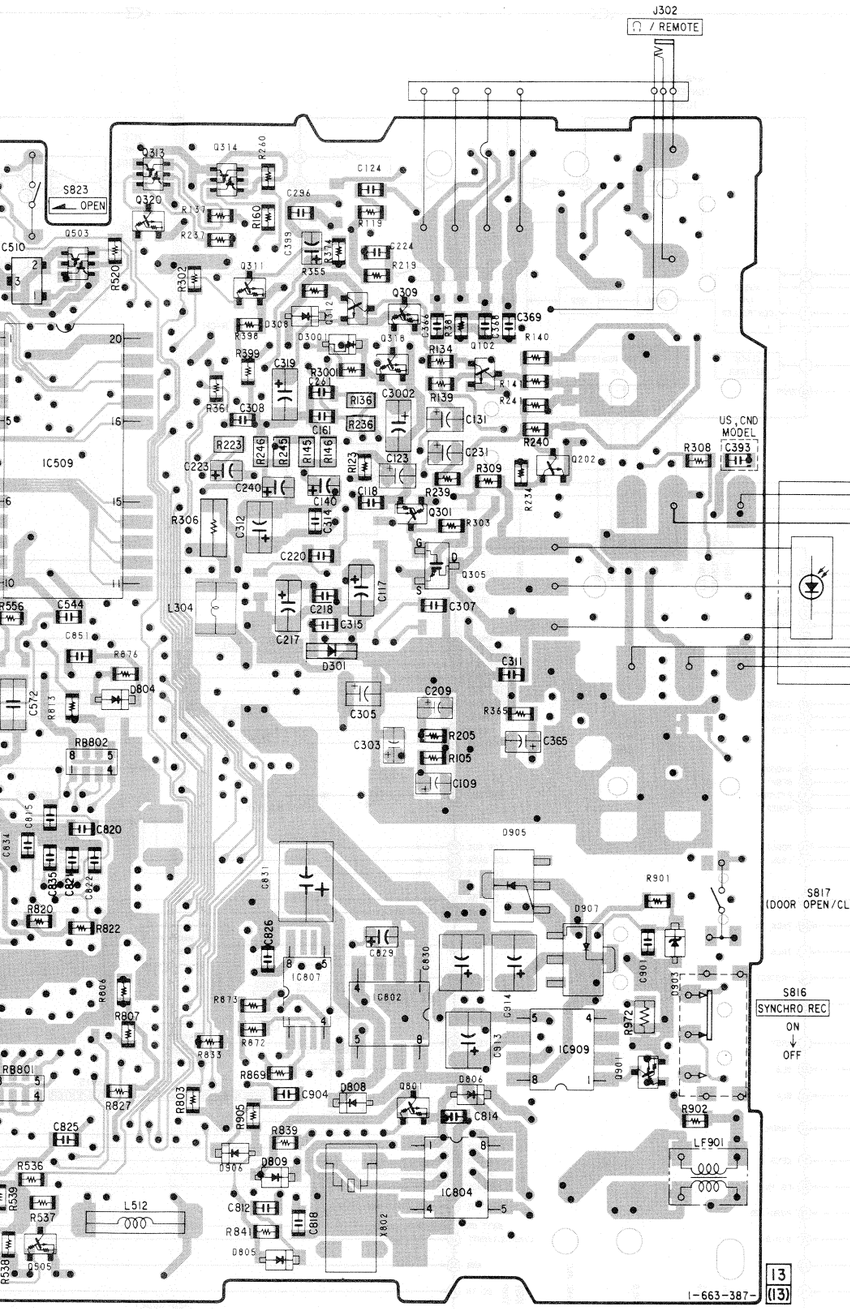
【MAIN BOARD】(SIDE A)

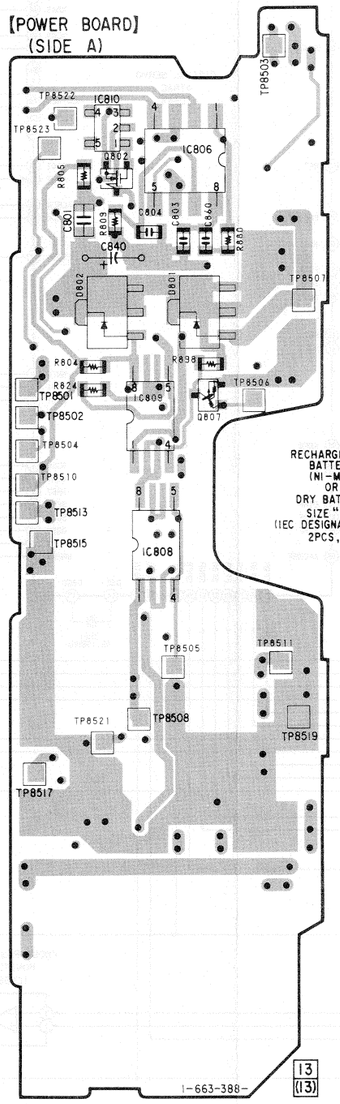
【MAIN BOARD】(SIDE B)

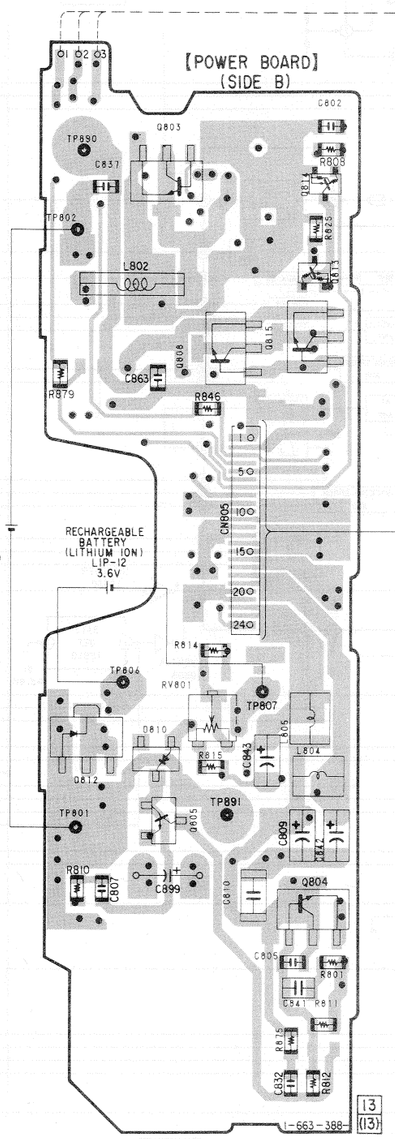
[MAIN BOARD] (SIDE B)

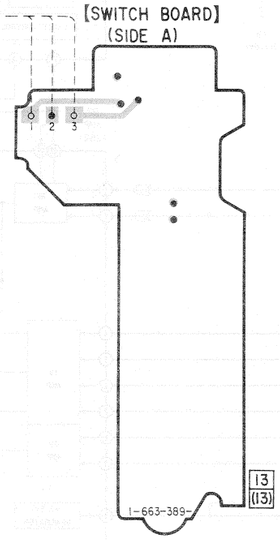


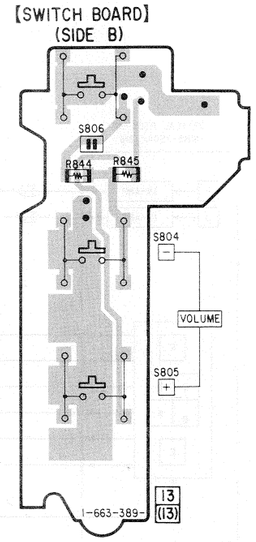












Note:

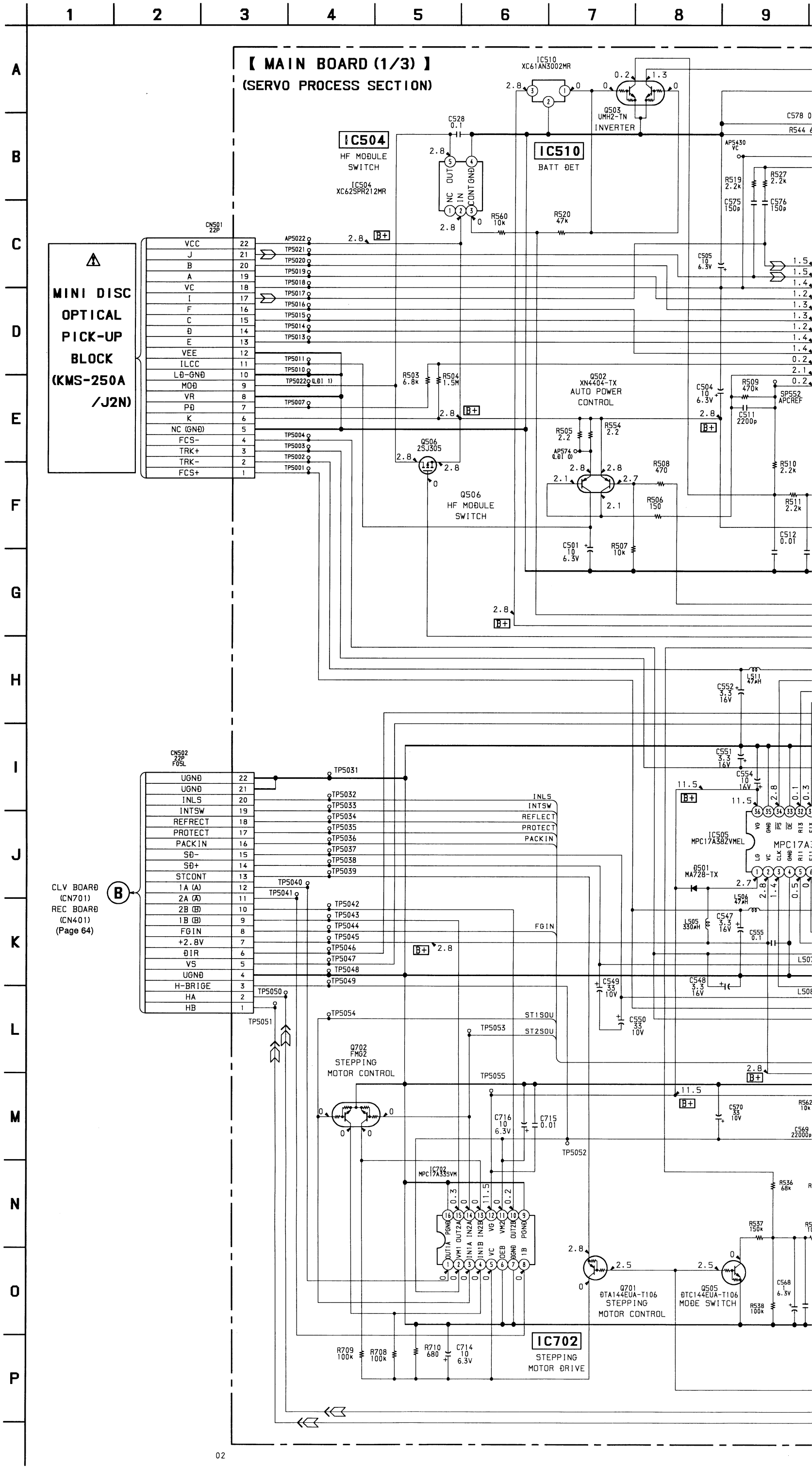
- ○— : parts extracted from the component side.
- ● : Through hole.
- ▒▒ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated)

Caution :

Pattern face side : (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side : (Component side) Parts on the parts face side seen from the parts face are indicated.

- Abbreviation
  CND : Canadian
  JE : Tourist

● Refer to page 65 for IC Block Diagrams.



ms.

7 8 9 10 11 12 13 14 15 16 17 18

IC510
ATT DET

Q503
UMH2-TN
INVERTER

IC501
RF AMP
IC501
CXA2523R

IC502
SWITCH
IC502
TC7S08F

IC503
DIGITAL SERVO,
ATRAC
IC503
CXD2652R

IC505
SLED, SPINDLE
MOTOR DRIVE
IC505
MPC17A38ZVMEL
MPC17A38

IC506
REC DRIVE
IC506
MPC18A20VM

IC508
FOCUS POSITION
MONITOR
IC508
NJM2107F-TE1

Q502
XN4404-TX
AUTO POWER
CONTROL

Q504
2SK1467-TD
B+ SWITCH

Q505
DTC144EUA-T106
MODE SWITCH

Q701
DTA144EUA-T106
STEPPING
MOTOR CONTROL

IC702
STEPPING
TOR DRIVE

D501
MA728-TX

D502
MA728-TX

D503
1SS367

D504
1SS367

SP548 BOTM
SP547 ABCD
TP5460 FE
SP544 ADFG
SP543 SE
TP5980 TE
SP569 ADFM
SP540 VREF
SP549 PEAK
SP550 PIT/GRV
SP551 RFO
SP552 APCREF
SP555 MNT2
SP556 SQSY
SP557 MNT3
SP567 MNT0
SP554 MNT1
SP568 EFMO
TP500 DGND
TP5052

(5) (6)

RFSW

A
MAIN BOARD
(2/3)
SYSTEM CONTROL
SECTION
(Page 51)

7 | 18 | 19 | 20 | 21 | 22 | 23 | 24

IC503
ĐIGITAL SERVO,
ATRAC

IC503
CXĐ2652R

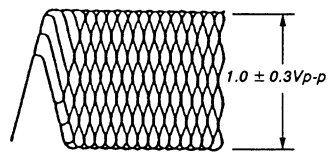
IC509
4M ĐRAM

IC509
HM51W4400BLTT-7

MAIN BOARĐ
(3/3)
AUĐIO SECTION
(Page 56)

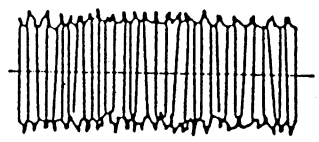
• WAVEFORMS

③



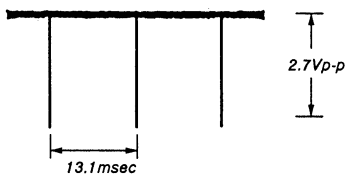
IC501 ㊳

④



IC501 ㉙

⑤



IC503 ⑪

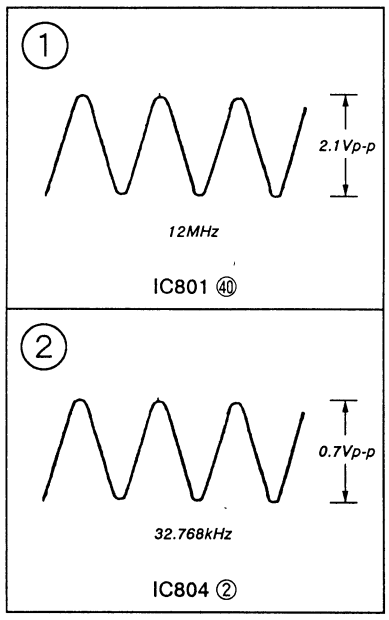
⑥

IC503 ⑰

Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- Power voltage is dc 6V and fed with regulated dc power supply from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ( ) : REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ▷ : PB
  ▷» : REC
- Abbreviation
  CND : Canadian
  JE : Tourist

• WAVEFORMS

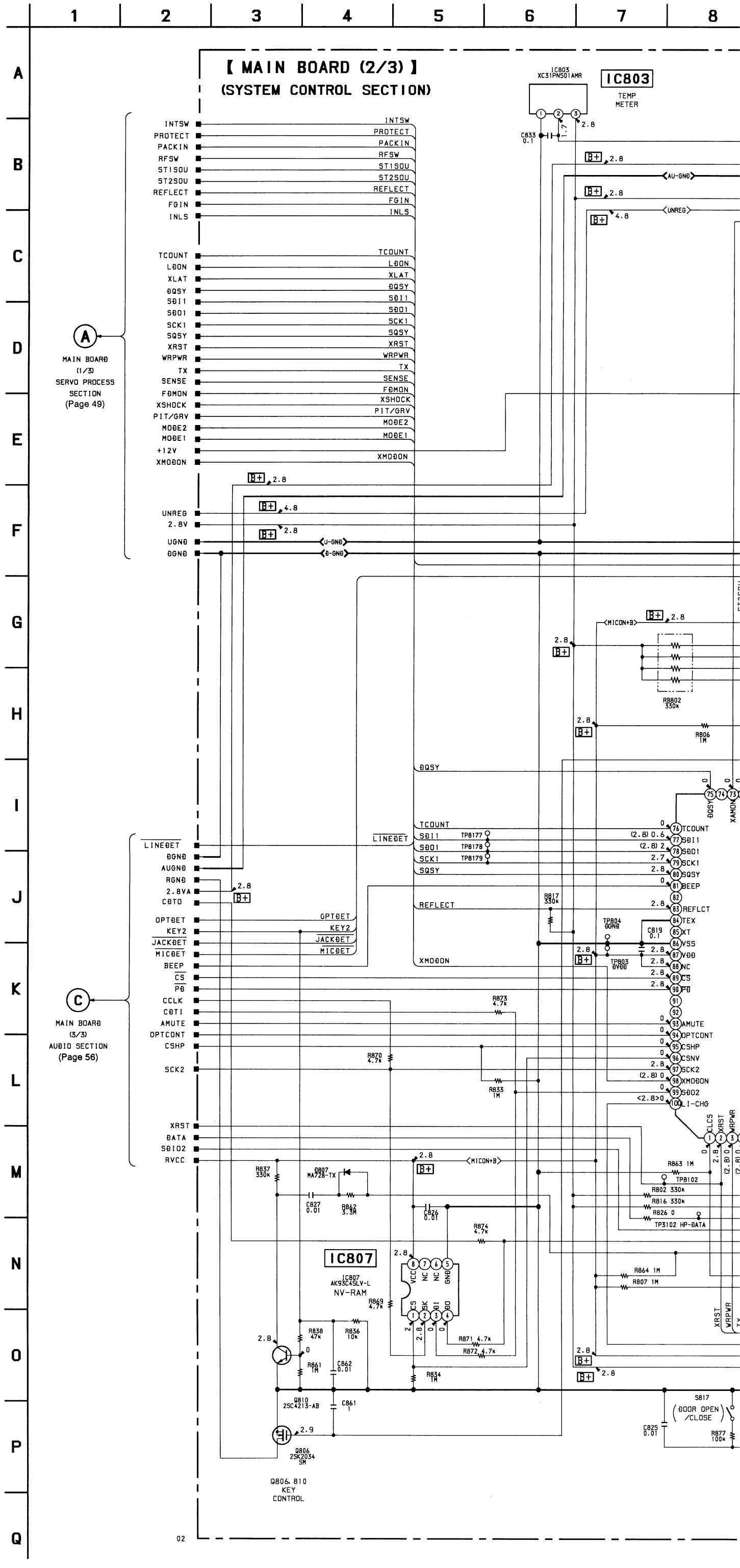


Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- Δ : internal component.
- B+ : B+ Line
- Power voltage is dc 6V and fed with regulated dc power suppl from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ( ) : REC
  〈 〉 : CHARGE
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

7-5. SCHEMATIC DIAGRAM – MAIN (2/3) SECTION –

• Refer to page 67 for IC Block Diagrams.



6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18

IC803 XC31PN501AMR

IC803
TEMP METER

IC802
RESET

IC802 RS5RJ2926

IC801
SYSTEM CONTROL

IC801 CXP819P60MR-4

IC909
CHARGE CONTROL

IC804
REAL TIME CLOCK

Q910 2SC4213-AB

Q904 2SB1182F5-QR -TLQR

Q904, 910 UNREG LIMITTER

Q901 DTC114EUAT106 CHARGE SWITCH

Q801 DTA144EUA -T106 LCD B+ SWITCH

Q907 DTC114YUA-T106 WAKE-UP

S808 REC

S809 CLOCK SET

S810 DIGITAL MEGA BASS

S811 AVLS

S816 SYNCHRO REC

S817 DOOR OPEN /CLOSE

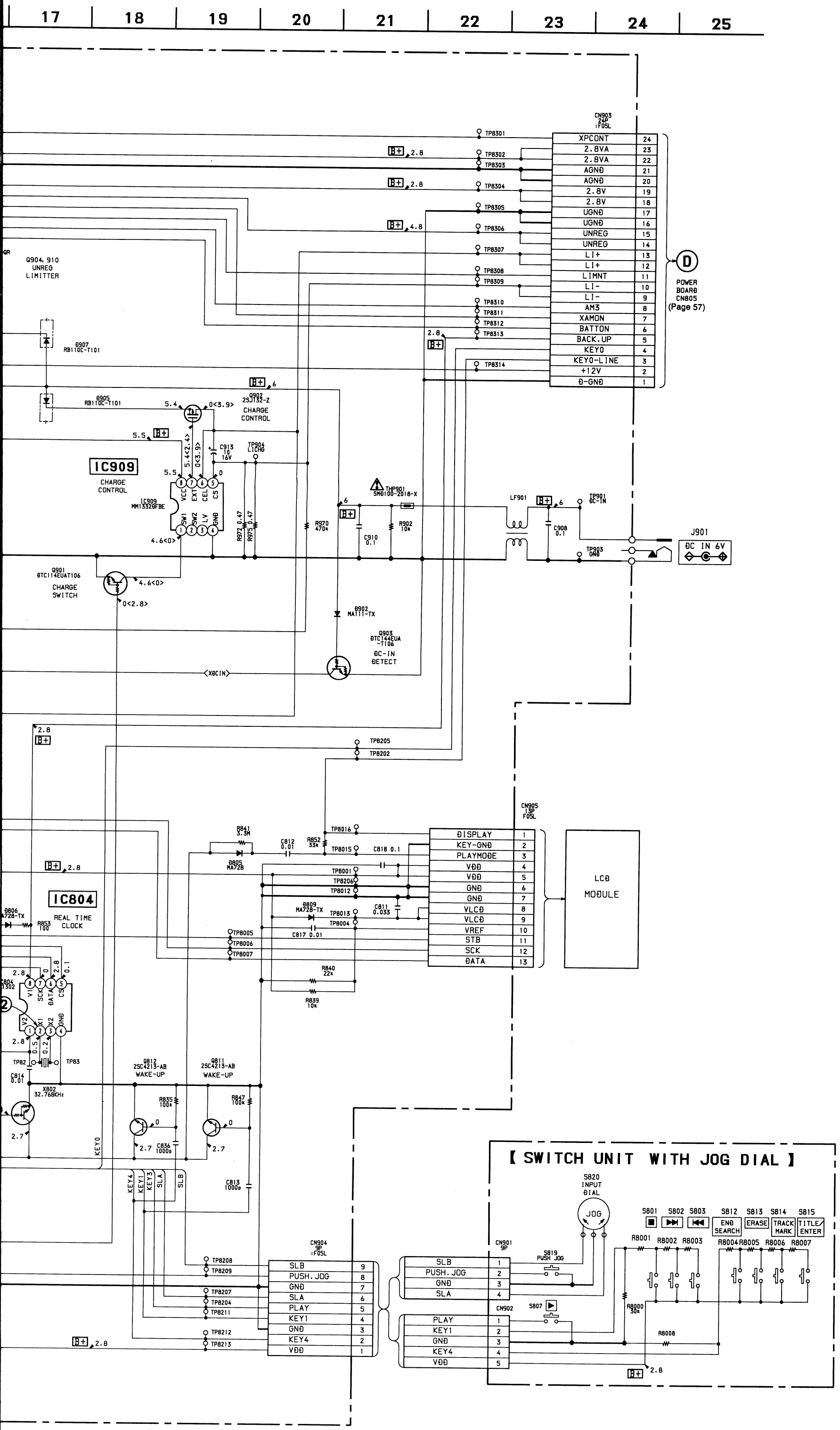
S818 HOLD

S823 OPEN

TAP803 TEST

X801 12MHz

X802 32.768KHz


17
18
19
20
21
22
23
24
25
CN903
24P
F05L
XPCONT 24
2.8VA 23
2.8VA 22
AGNÐ 21
AGNÐ 20
2.8V 19
2.8V 18
UGNÐ 17
UGNÐ 16
UNREG 15
UNREG 14
LI+ 13
LI+ 12
LIMNT 11
LI- 10
LI- 9
AM3 8
XAMON 7
BATTON 6
BACK.UP 5
KEYO 4
KEYO-LINE 3
+12V 2
Ð-GNÐ 1
TP8301
TP8302
TP8303
TP8304
TP8305
TP8306
TP8307
TP8308
TP8309
TP8310
TP8311
TP8312
TP8313
TP8314
D
POWER BOARÐ CN805
(Page 57)
Q904, 910
UNREG
LIMITTER
Ð907
RB110C-T101
Ð905
RB110C-T101
Ð902
2SJ132-Z
CHARGE CONTROL
IC909
CHARGE CONTROL
IC909
MM1332ØFBE
C913
10
16V
TP904
LICHG
THP901
SMÐ100-2018-X
R970
470k
C910
0.1
R902
10k
R972 0.47
R975 0.47
LF901
TP901
ÐC-IN
C908
0.1
TP903
GNÐ
J901
ÐC IN 6V
Q901
ÐTC114EUAT106
CHARGE SWITCH
Ð902
MA111-TX
Q903
ÐTC144EUA
-T106
ÐC-IN
ÐETECT
<XØCIN>
TP8205
TP8202
CN905
13P
F05L
ÐISPLAY 1
KEY-GNÐ 2
PLAYMOÐE 3
VÐÐ 4
VÐÐ 5
GNÐ 6
GNÐ 7
VLCÐ 8
VLCÐ 9
VREF 10
STB 11
SCK 12
ÐATA 13
LCÐ MOÐULE
R841
3.3M
C812
0.01
R852
33k
C818 0.1
Ð805
MA728
TP8016
TP8015
TP8001
TP8206
TP8012
TP8013
TP8004
C811
0.033
C817 0.01
TP8005
TP8006
TP8007
R840
22k
R839
10k
IC804
REAL TIME CLOCK
Ð806
A728-TX
R853
100
Ð809
MA728-TX
X802
32.768KHz
C814
0.01
Q812
2SC4213-AB
WAKE-UP
Q811
2SC4213-AB
WAKE-UP
R835
100k
R847
100k
C836
1000p
C813
1000p
KEYO
KEY4
KEY1
KEY3
SLA
SLB
TP8208
TP8209
TP8207
TP8204
TP8211
TP8212
TP8213
CN904
9P
F05L
SLB 9
PUSH.JOG 8
GNÐ 7
SLA 6
PLAY 5
KEY1 4
GNÐ 3
KEY4 2
VÐÐ 1
CN901
9P
SLB 1
PUSH.JOG 2
GNÐ 3
SLA 4
S819
PUSH JOG
CN902
PLAY 1
KEY1 2
GNÐ 3
KEY4 4
VÐÐ 5
S807
【 SWITCH UNIT WITH JOG DIAL 】
S820
INPUT
ÐIAL
JOG
S801
S802
S803
S812
ENÐ SEARCH
S813
ERASE
S814
TRACK MARK
S815
TITLE/ ENTER
R8001
R8002
R8003
R8004
R8005
R8006
R8007
R8000
30k
R8008

● Refer to page 68 for IC Block Diagrams.

【MAIN BOARD (3/3)】

(AUDIO SECTION)

IC301 +2.5V REG

IC302 MIC AMP

IC303 A/D, D/A CONVERTER

IC304 BUFFER

IC306 MUTE DRIVE

IC352 AUDIO GAIN CONTROL

IC805 HP AMP

Q101, 201 MIC ATT

Q102, 202 MUTE

Q301, 305 OPT CONTROL

Q313, 314 BEEP SWITCH

J301 MIC (PLUG IN POWER)

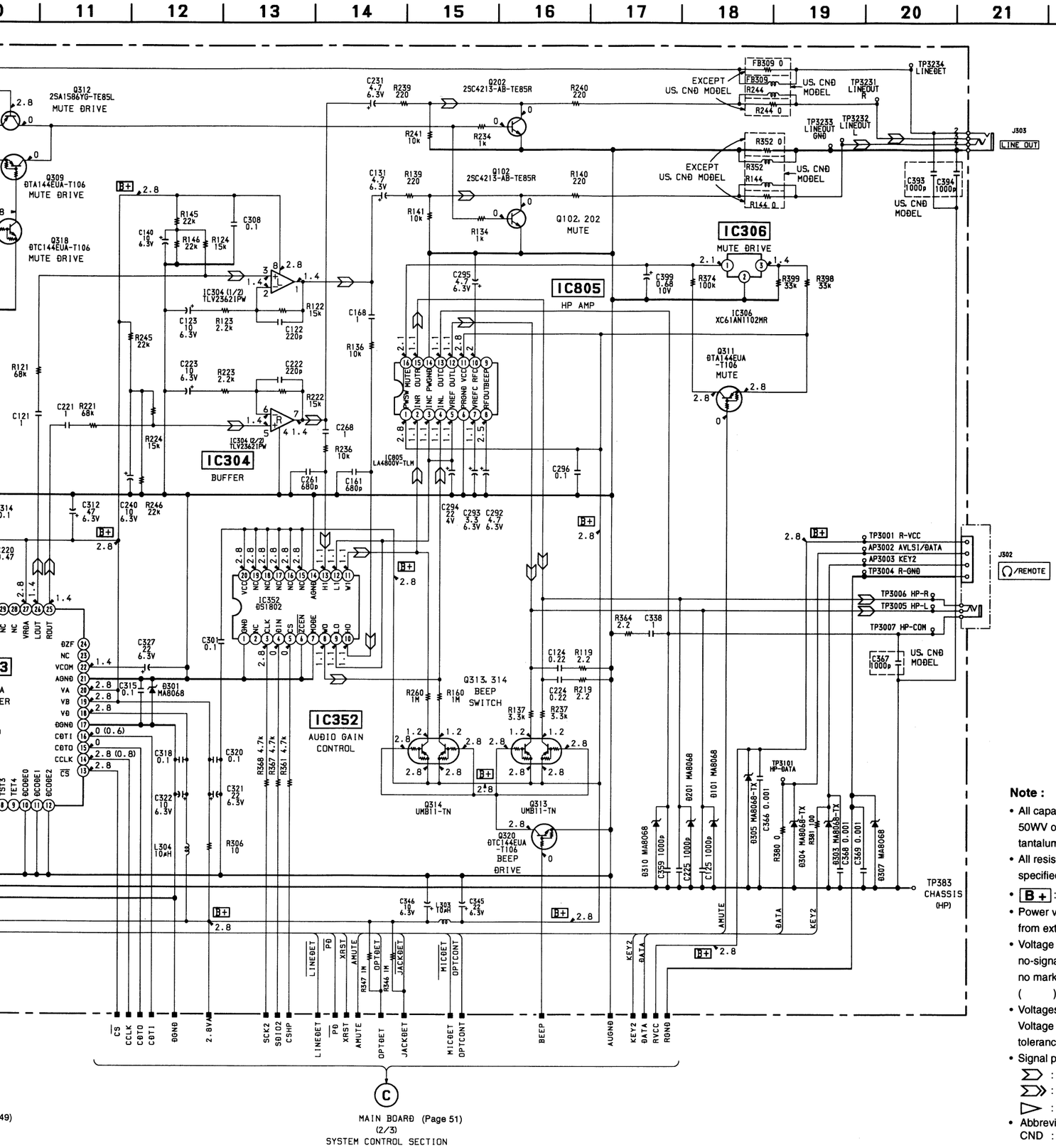
J304 LINE IN (OPTICAL)

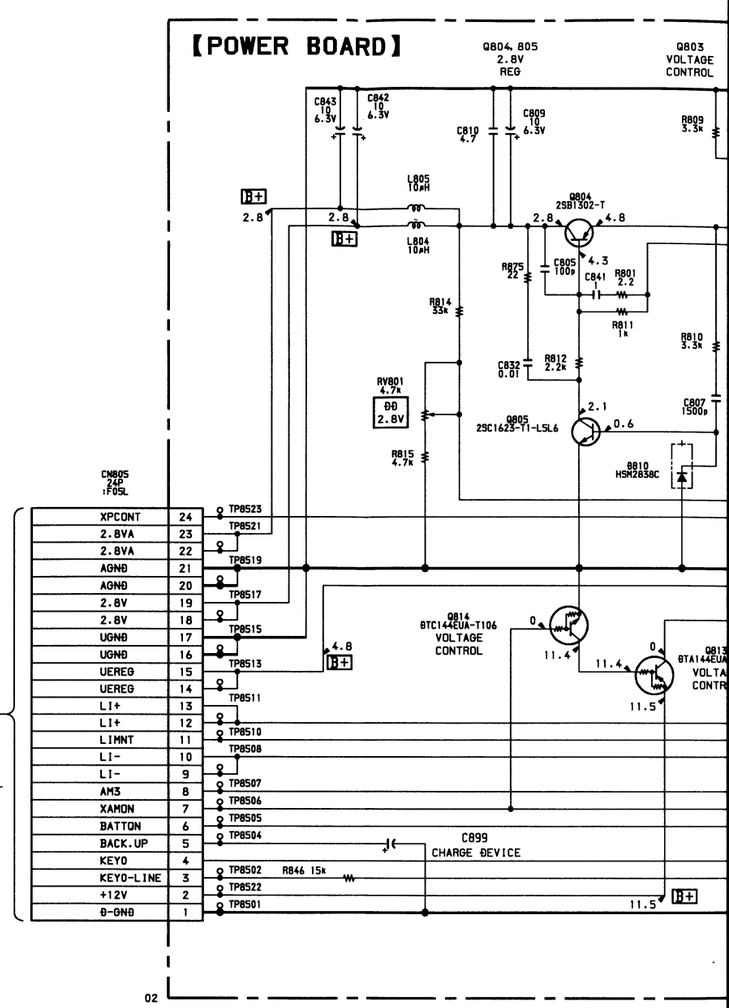
US, CND MODEL

EXCEPT US, CND MODEL

(E) MAIN BOARD (Page 49) (1/3) SERVO PROCESS SECTION

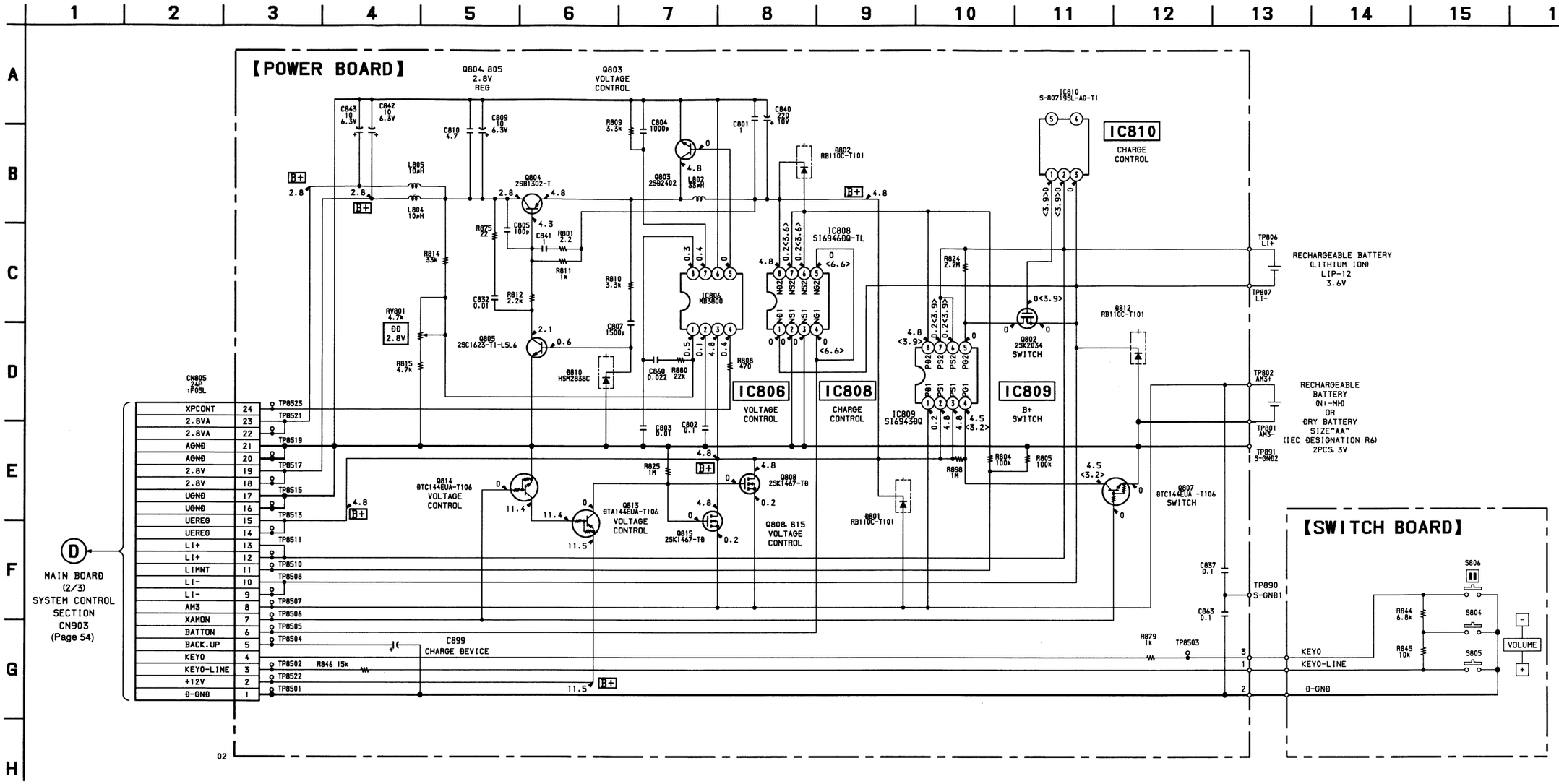
(C) MAIN BOARD (Page 51) (2/3) SYSTEM CONTROL SECTION





Note :

- All capacitors are in µF unless otherwise noted. pF: µµF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- Power voltage is dc 6V and fed with regulated dc power supply from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ( ) : REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB
  : REC
  : MIC
- Abbreviation
  CND : Canadian



acitors are in µF unless otherwise noted. pF: µµF
or less are not indicated except for electrolytics and
ns.
stors are in Ω and 1/4 W or less unless otherwise
d.
: B+ Line
voltage is dc 6V and fed with regulated dc power supply
ternal power voltage jack (J901).
and waveforms are dc with respect to ground under
al conditions.
(: PB
) : REC
s are taken with a VOM (Input impedance 10MΩ).
variations may be noted due to normal production
es.
ath.
PB
REC
MIC
iation
Canadian

Note :

- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- : adjustment for repair.
- Power voltage is dc 6V and fed with regulated dc power supply from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

7-8. PRINTED WIRING BOARDS – CONTROL SECTION –

• **SEMICONDUCTOR LOCATION**

Ref. No.	Location
D401	A - 11
D402	B - 12
IC701	B - 7
Q401	B - 11
Q402	A - 11
Q403	B - 12
Q404	A - 12
Q703	B - 2

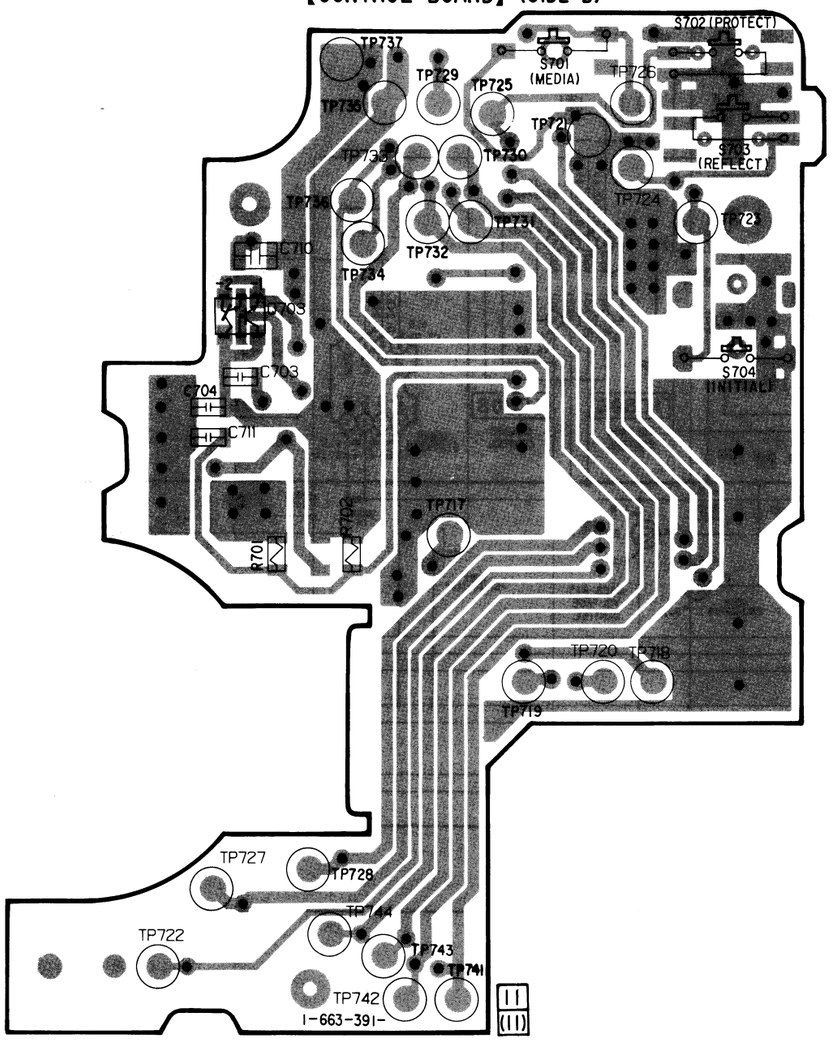
Note:

- ○— : parts extracted from the component side.
- ● : Through hole.
- ▒▒ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated)

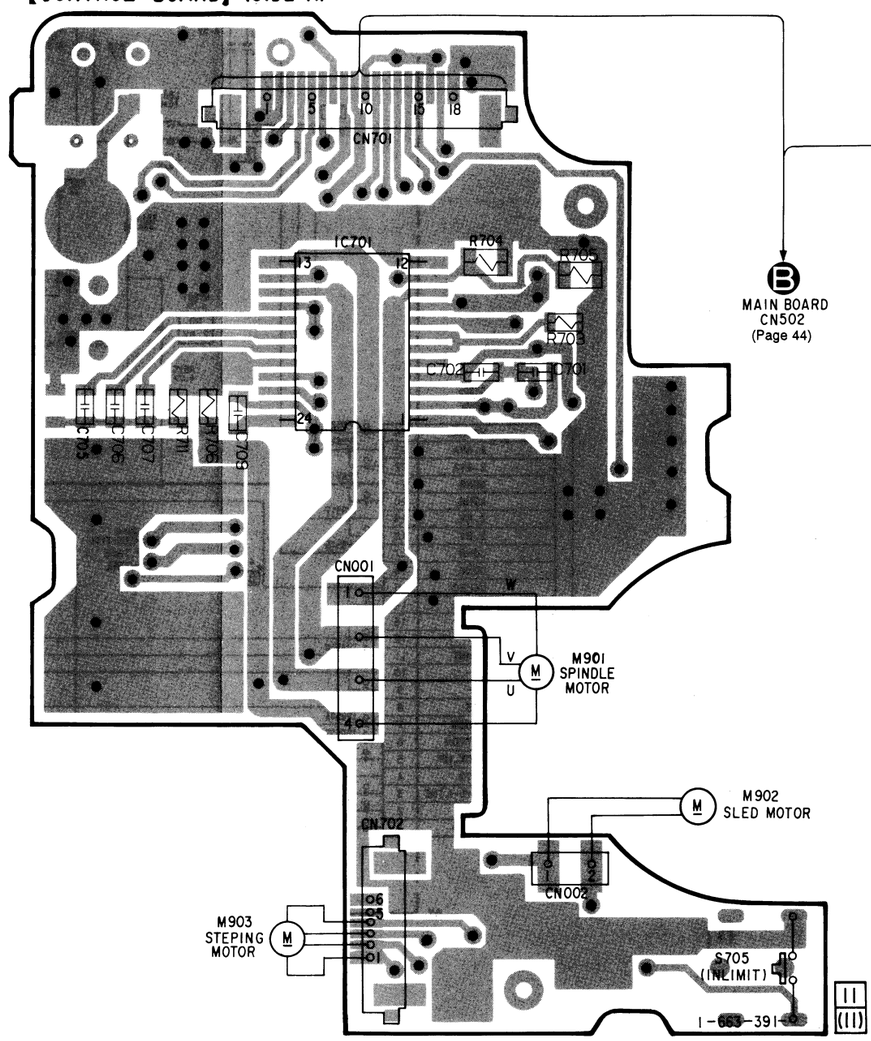
Caution :

Pattern face side : (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side : (Component side) Parts on the parts face side seen from the parts face are indicated.

【CONTROL BOARD】 (SIDE B)

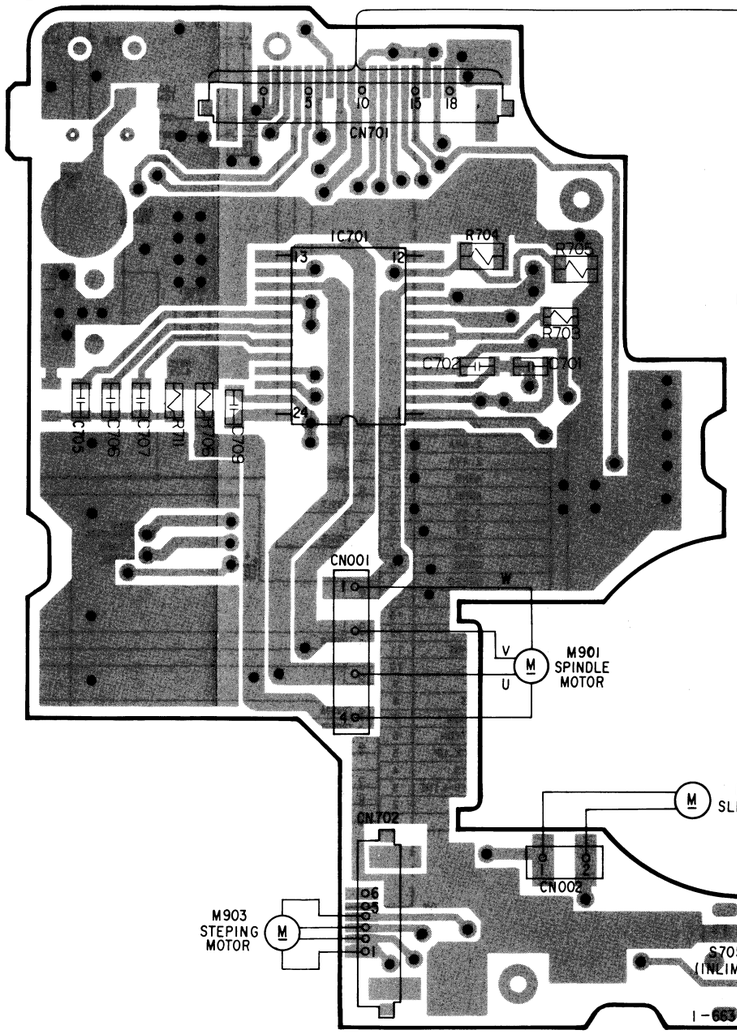


【CONTROL BOARD】 (SIDE A)



S702 (PROTECT)
S703 (REFLECT)
TP72
S704 (INITIAL)

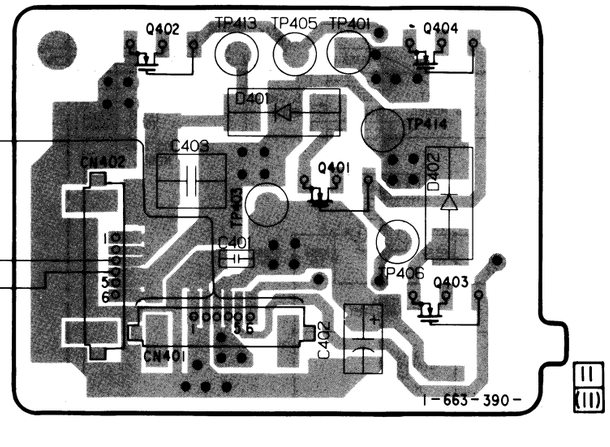
【CONTROL BOARD】(SIDE A)



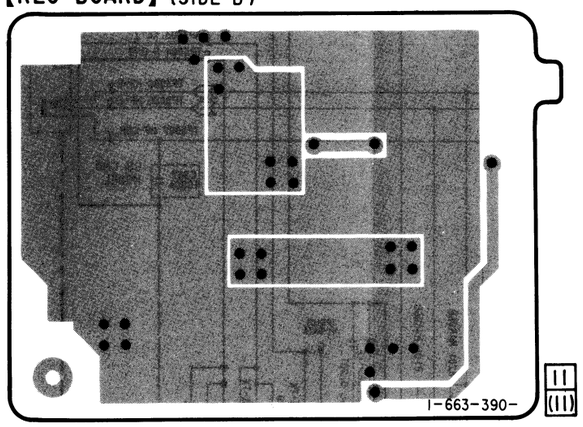
HR901 OVER WRITE HEAD

Ⓑ MAIN BOARD CN502 (Page 44)

【REC BOARD】(SIDE A)



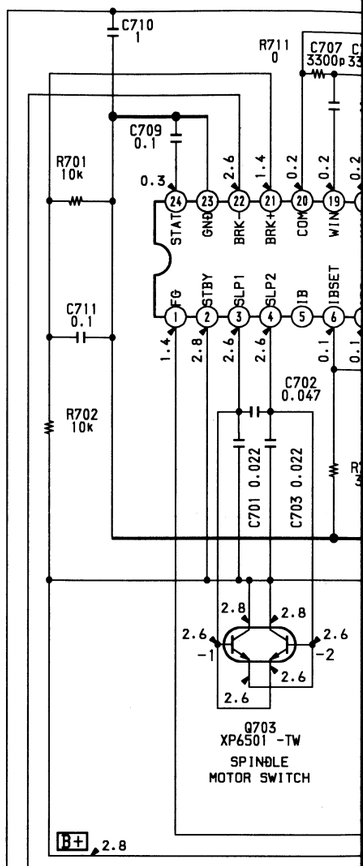
【REC BOARD】(SIDE B)



Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- Power voltage is dc 6V and fed with regulated dc power supply from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ( ) : REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

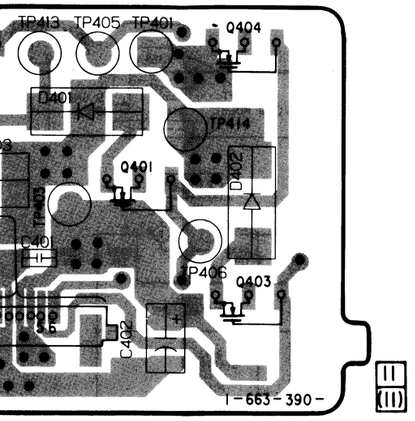
【 CONTROL BOARD 】



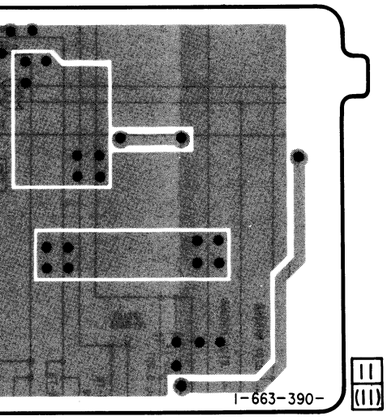
02

11 | 12

(IDE A)



(IDE B)

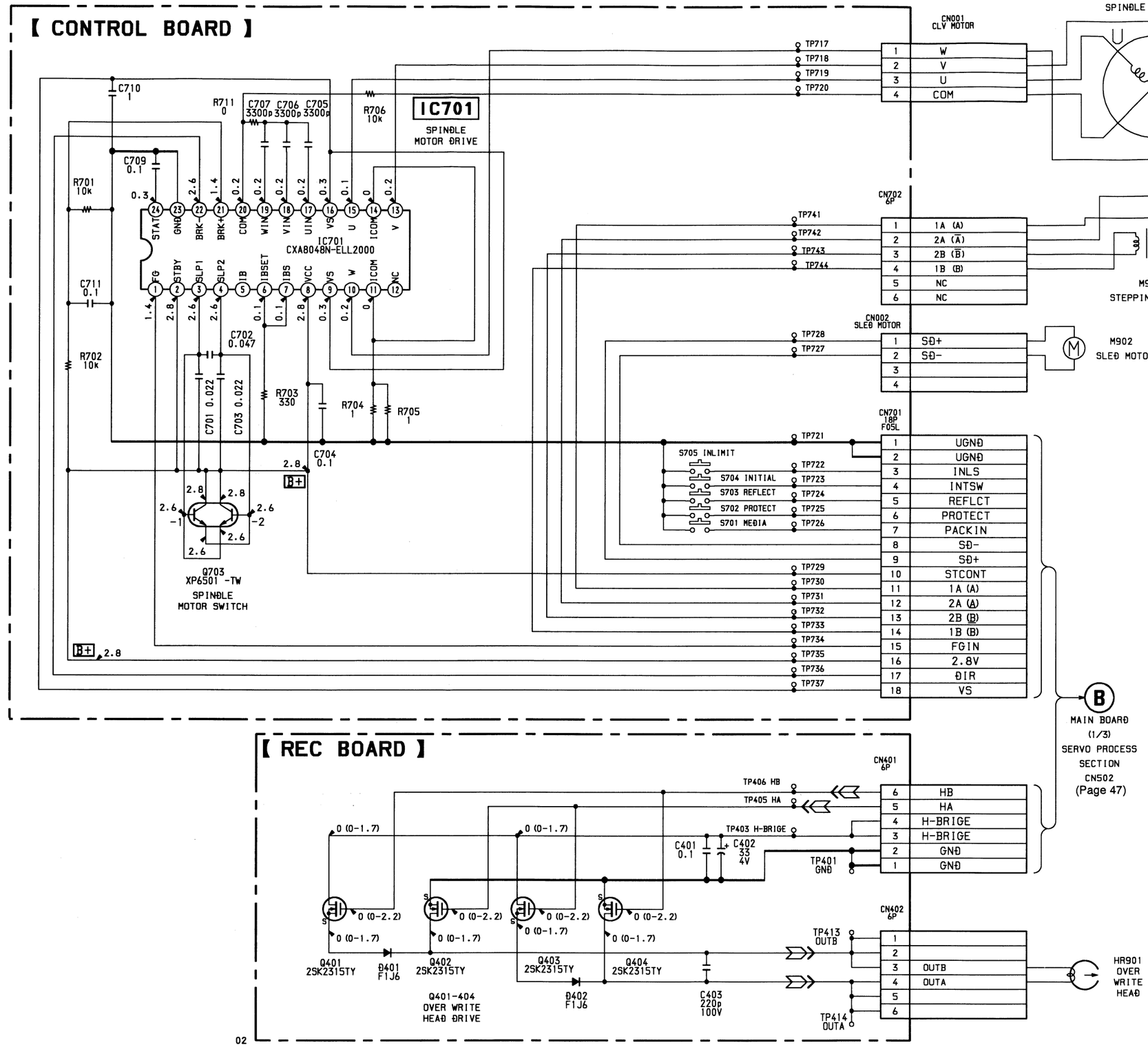


Note :

- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line
- Power voltage is dc 6V and fed with regulated dc power supply from external power voltage jack (J901).
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : PB
  ( ) : REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

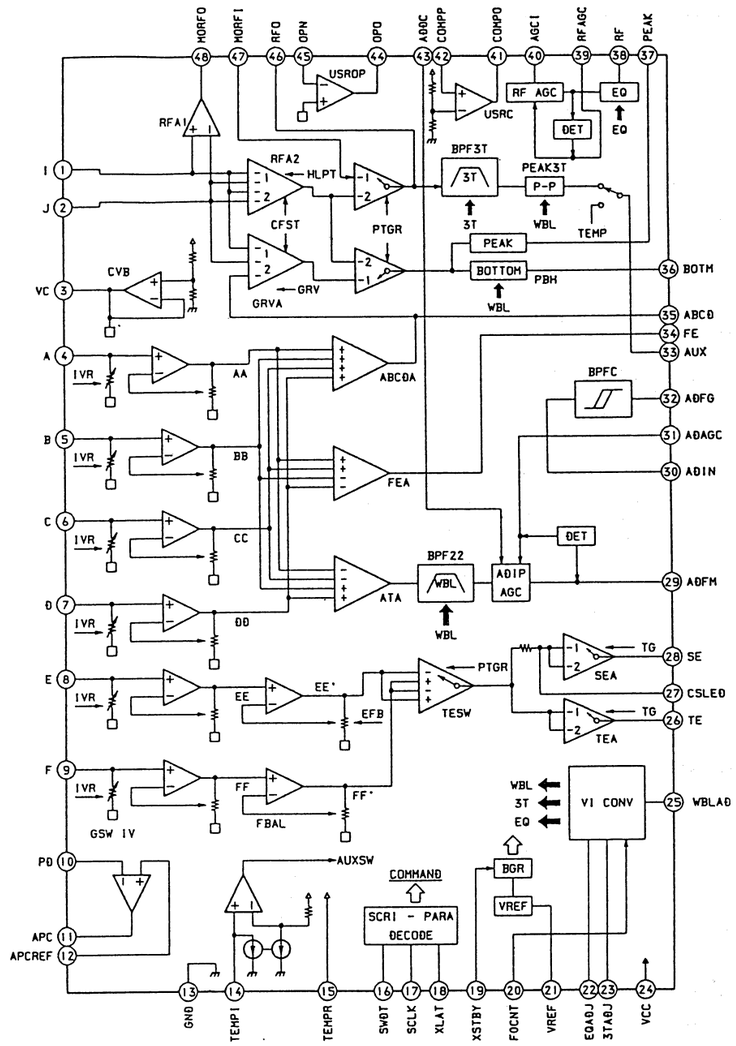
1 2 3 4 5 6 7 8 9 10 11

A B C D E F G H I

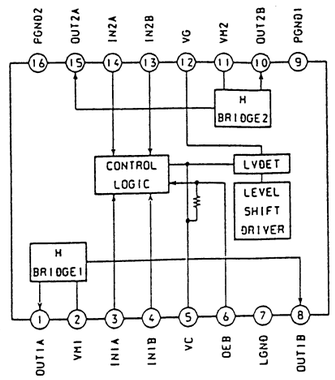


• IC BLOCK DIAGRAMS – MAIN (1/3) SECTION –

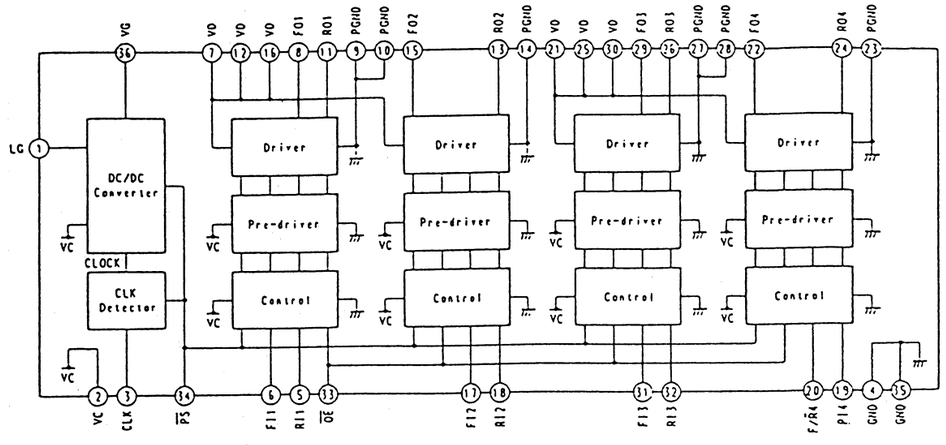
IC501 CXA2523R



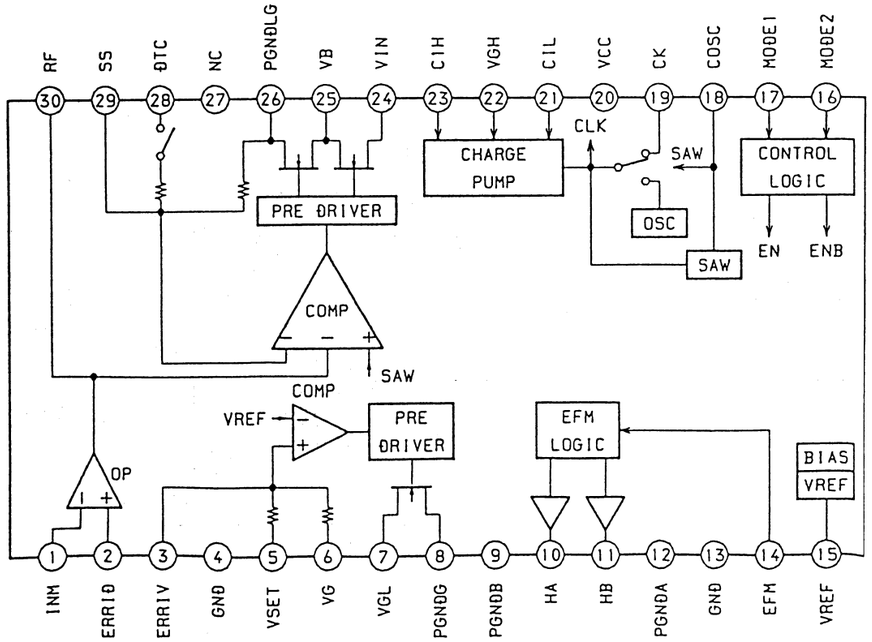
IC702 MPC17A33SVMEL



IC505 MPC17A38VMEL

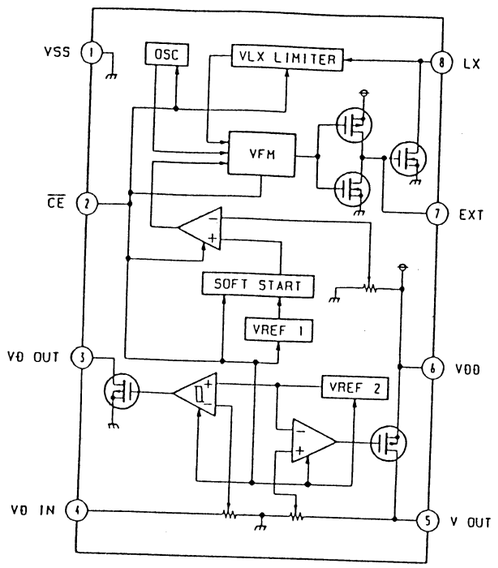


IC506 MPC18A20VMEL

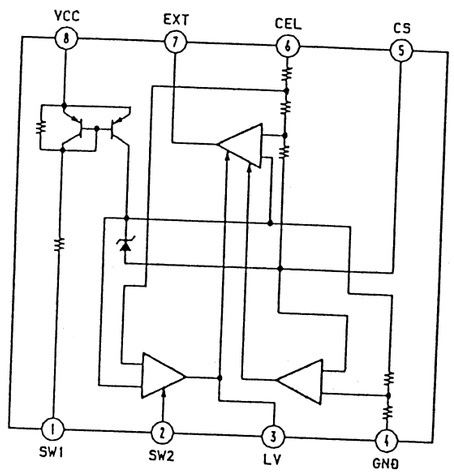


• IC BLOCK DIAGRAMS – MAIN (2/3) SECTION –

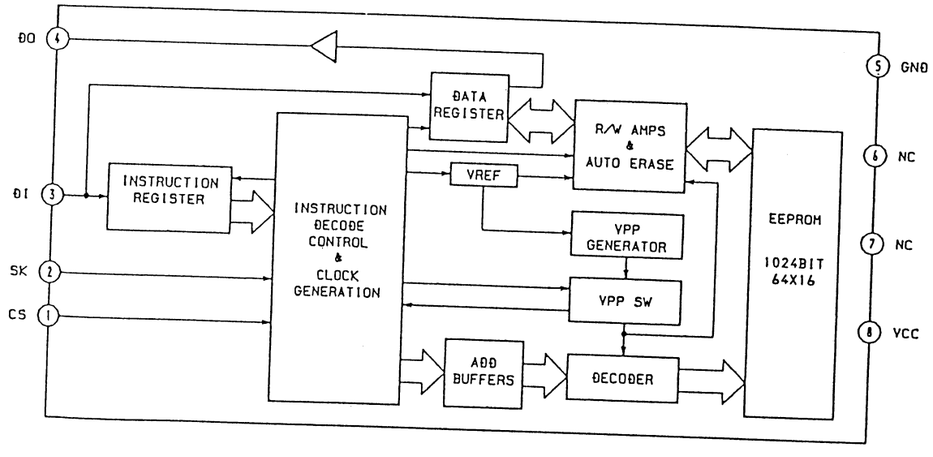
IC802 RS5RJ29261-T1



IC909 MM1332DFBE

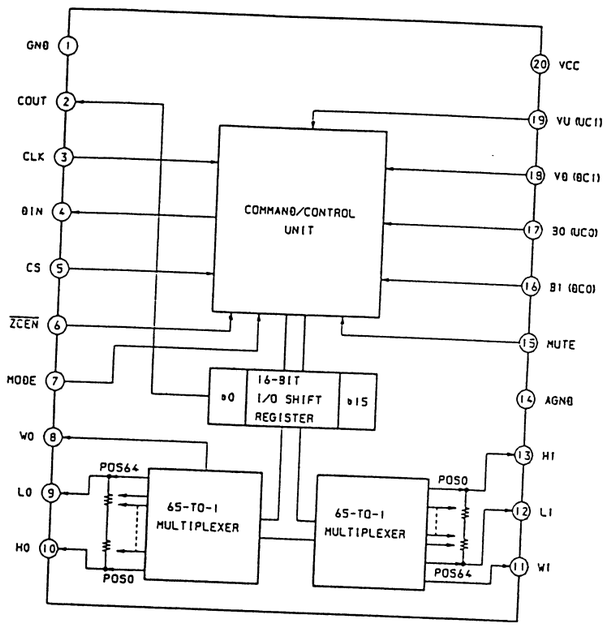


IC807 AK93C45LV-L

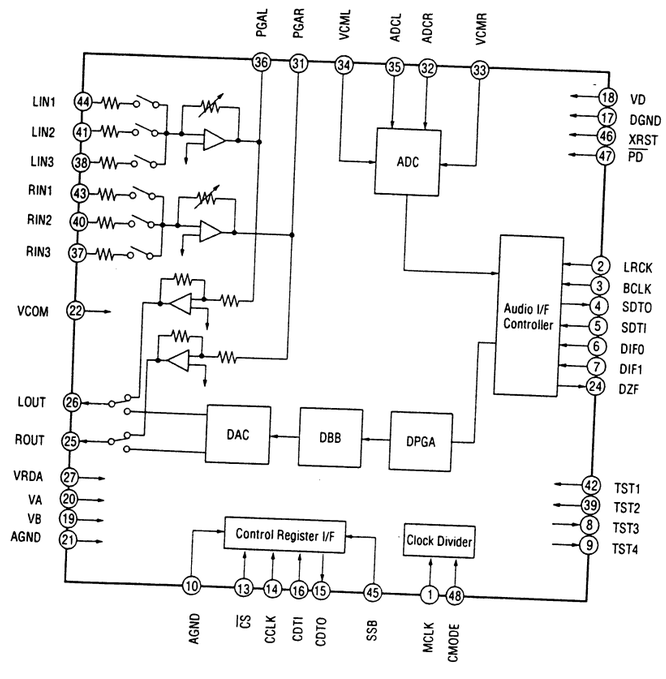


• IC BLOCK DIAGRAMS – MAIN (3/3) SECTION –

IC352 DS1802E-TE2



IC303 AK4515-VQ



SECTION 8
EXPLODED VIEWS

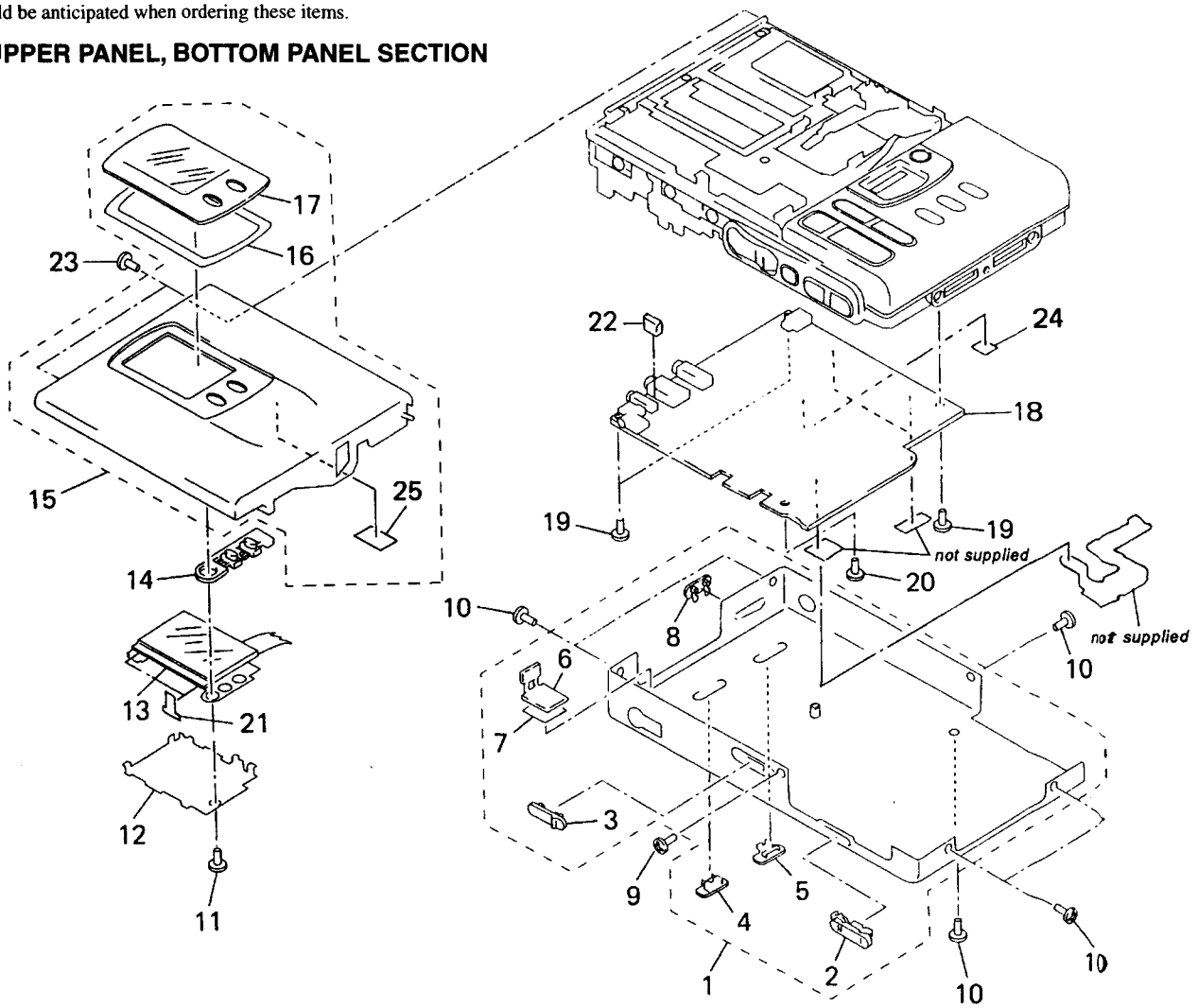
NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Color indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ··· (RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.
- Abbreviation
  CND : Canadian
  AUS : Australian

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

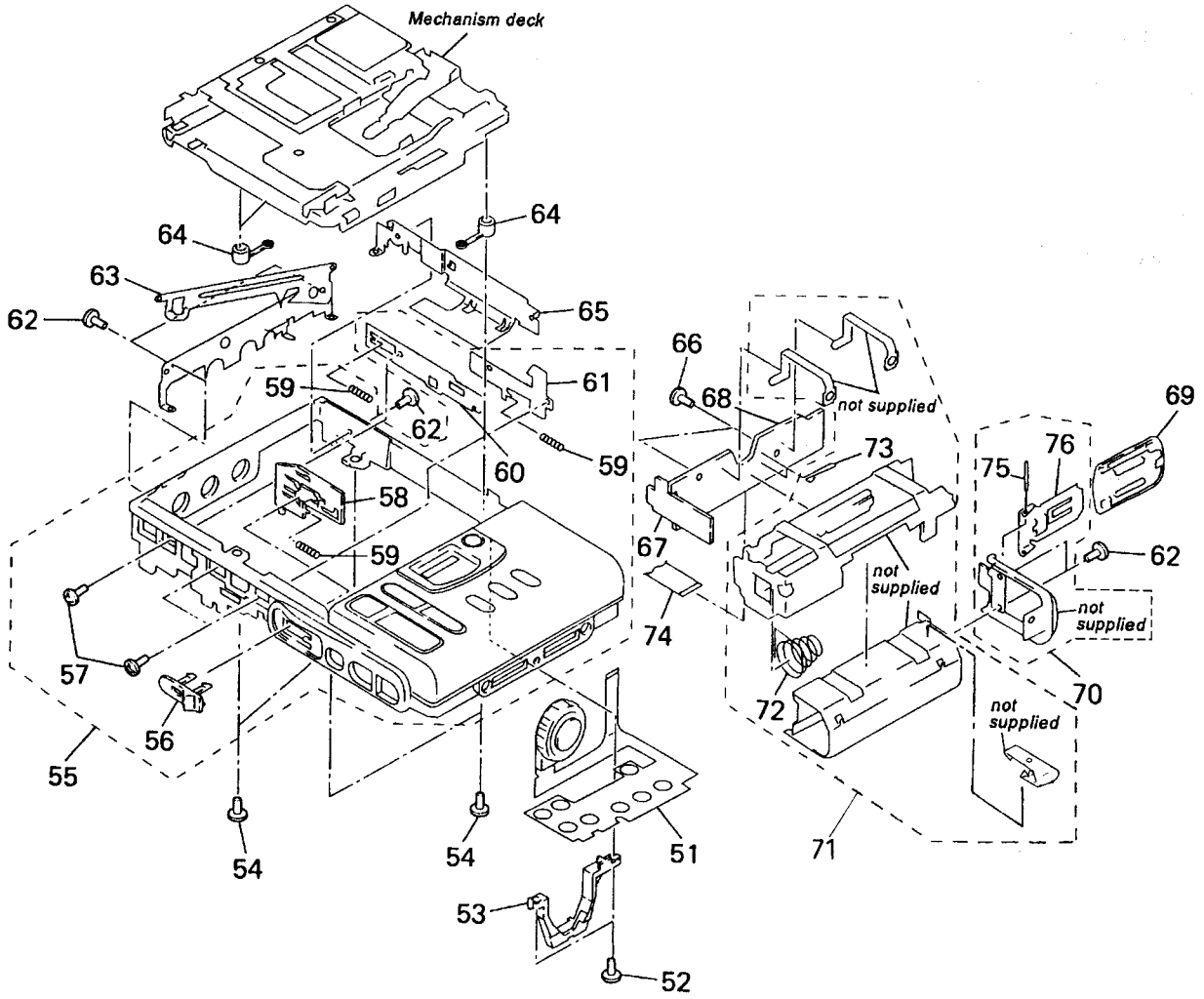
Les composants identifiés par une marque ⚠sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

8-1.UPPER PANEL, BOTTOM PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4947-770-1	PANEL ASSY, BOTTOM	
2	4-986-207-01	KNOB (TUN)	
3	4-983-999-01	KNOB (OPEN)	
4	4-972-492-11	KNOB (AVLS)	
5	4-963-851-11	KNOB (AVLS)	
6	4-986-204-01	BUTTON (DBB)	
7	4-986-205-01	SHEET (DBB), ADHESIVE	
8	4-984-000-01	KNOB (DBB)	
9	4-984-017-11	SCREW (1.7X2.5), TAPPING	
10	4-963-883-41	SCREW (M1.4), PRECISION PAN	
11	4-963-883-21	SCREW (M1.4), PRECISION PAN	
12	4-986-190-01	HOLDER (LCD)	
13	1-801-522-11	LCD MODULE	
14	4-986-189-01	BUTTON (DISP)	
15	X-4947-769-1	PANEL ASSY, UPPER	
16	4-986-185-01	SHEET (LCD WINDOW), ADHESIVE	
17	4-986-184-11	WINDOW (LCD)	
18	A-3293-312-A	MAIN BOARD, COMPLETE (E, Tourist)	
18	A-3293-360-A	MAIN BOARD, COMPLETE (AEP, UK, AUS)	
18	A-3293-361-A	MAIN BOARD, COMPLETE (US, CND)	
19	3-335-797-91	SCREW (M1.4), TOOTHED LOCK	
20	3-375-114-21	SCREW (M1.7X2.5)	
* 21	4-988-279-01	CUSHION (LCD)	
* 22	4-988-280-01	CUSHION	
23	4-963-883-21	SPACER (M1.4), PRECISION PAN (SILVER)	
23	4-963-883-31	SPACER (M1.4), PRECISION PAN (BLUE)	
24	3-831-441-11	CUSHION (A)	
* 25	4-988-105-01	CUSHION (HEAD)	

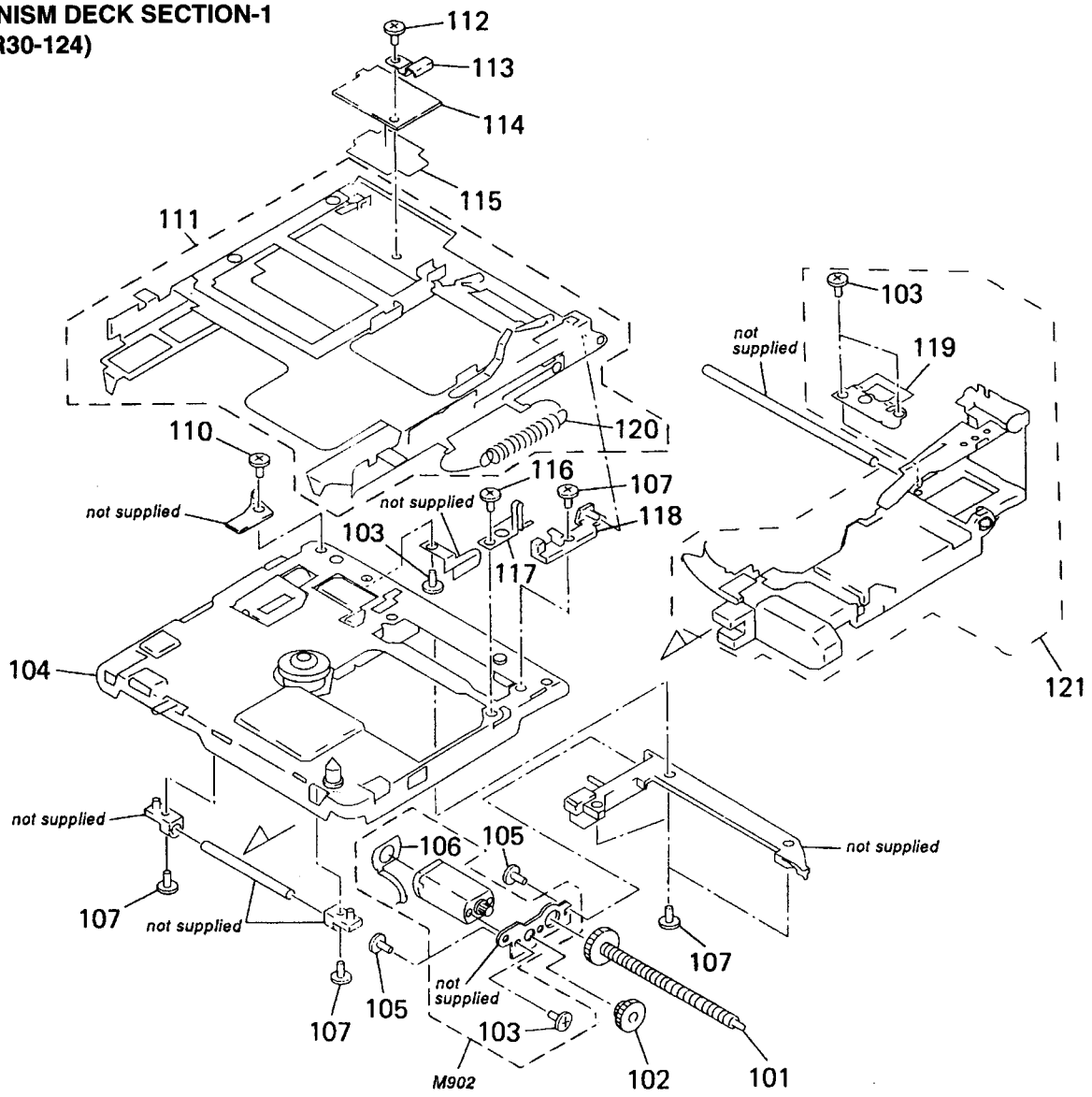
8-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark
51	1-473-895-11	SWITCH UNIT (WITH JOG DIAL)	
52	4-984-017-11	SCREW (1.7X2.5), TAPPING	
53	4-986-186-01	RETAINER (DIAL)	
54	4-963-924-01	SCREW (DAMPER)	
55	X-4947-771-1	BELT ASSY, ORNAMENTAL	
56	4-983-998-01	KNOB (REC)	
57	4-984-006-01	SCREW, STEP	
58	4-983-995-01	LEVER (REC)	
59	4-984-004-01	SPRING (LOCK), COMPRESSION	
60	4-983-993-01	LEVER (OPEN)	
61	4-983-994-01	ARM, LOCK	
62	4-963-883-21	SCREW (M1.4), PRECISION PAN···(SILVER)	
62	4-963-883-31	SCREW (M1.4), PRECISION PAN···(BLUE)	
63	X-4947-717-1	PLATE ASSY, FULCRUM	
64	4-983-311-01	DAMPER	

Ref. No.	Part No.	Description	Remark
65	4-986-188-01	REINFORCEMENT	
66	3-335-797-91	SCREW (M1.4), TOOTHED LOCK	
67	A-3306-147-A	SWITCH BOARD, COMPLETE	
68	A-3293-253-A	POWER BOARD, COMPLETE	
69	4-986-183-01	LID, BATTERY CASE	
70	X-4947-720-1	PLATE (BATTERY)ASSY,ORNAMENTAL ···(SILVER)	
70	X-4947-842-1	PLATE (BATTERY)ASSY, (L)···(BLUE)	
71	X-4947-772-1	CASE ASSY, BATTERY	
72	4-984-016-01	SPRING (POP UP), COIL	
73	4-988-114-01	TERMINAL, BATTERY	
74	1-777-761-11	WIRE (FLAT TYPE) (24 CORE)	
75	4-984-019-01	SHAFT (BATTERY CASE LID)	
76	4-984-018-01	PLATE, FULCRUM	

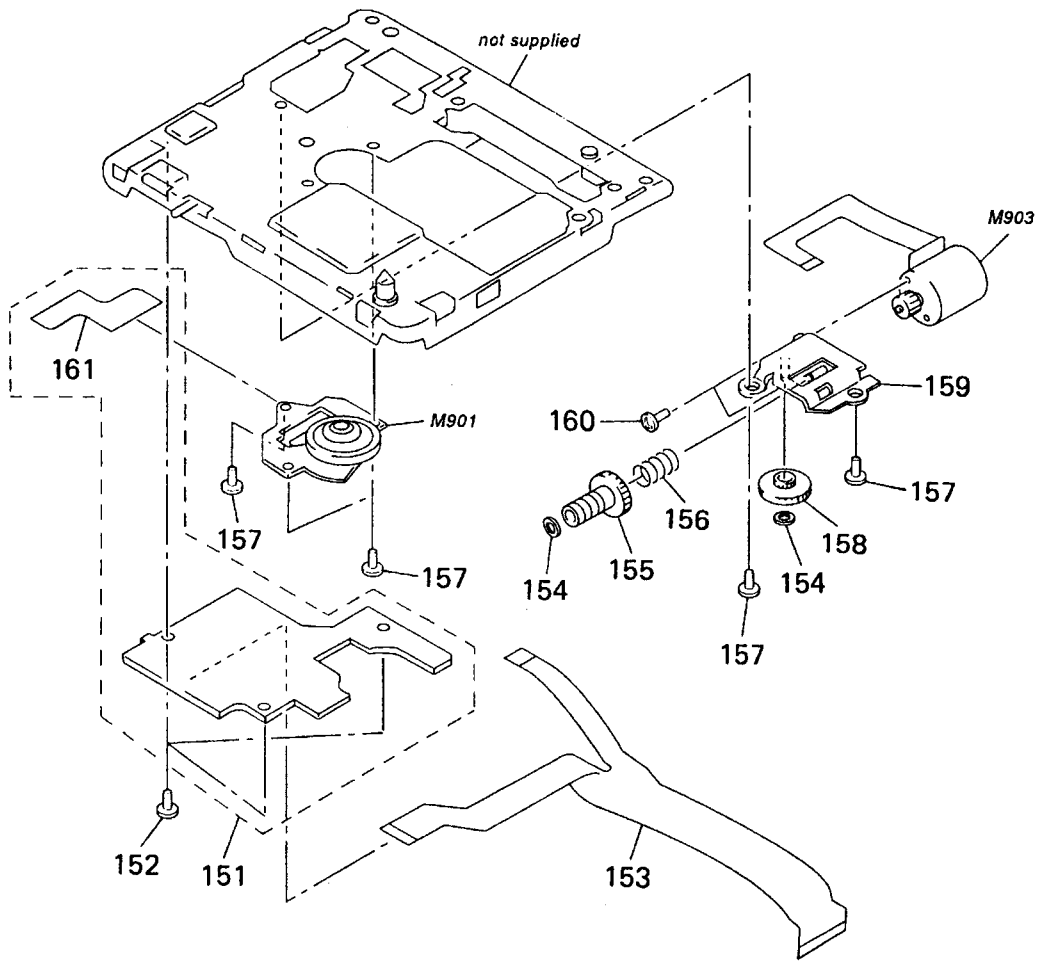
8-3. MECHANISM DECK SECTION-1 (MT-MZR30-124)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
101	A-3303-501-A	SCREW BLOCK ASSY, LEAD	
102	4-972-548-01	GEAR (BH)	
103	3-366-890-11	SCREW (M1.4)	
104	X-4947-429-1	CHASSIS ASSY	
105	4-964-537-01	SCREW (M1.4X4.5), TAPPING	
106	1-651-018-11	SLED FLEXIBLE BOARD	
107	3-704-197-33	SCREW (M1.4X3.0), LOCKING	
110	4-964-538-01	SCREW (M1.4X2)	
111	X-4947-887-1	HOLDER ASSY	
112	4-955-841-01	SCREW	
113	4-988-174-01	STOPPER, LEVER	
* 114	1-663-390-11	REC BOARD	
115	4-984-032-01	SHEET, INSULATING	
116	3-348-160-01	SCREW (M1.4X1.3),PRECISION PAN	
117	4-983-357-01	CLAW, LOCK RELEASE	
* 118	4-983-356-01	GUIDE, HOLDER	
119	4-963-914-02	RACK (INSERTER)	
120	4-983-358-01	SPRING, TENSION	
⚠121	X-4948-260-1	OPTICAL PICK-UP ASSY	
M902	A-3303-502-A	MOTOR BLOCK ASSY (SLED)	

8-4. MECHANISM DECK SECTION-2
(MT-MZR30-124)



Ref. No.	Part No.	Description	Remark
151	A-3293-256-A	CONTROL PC BOARD ASSY,	
152	3-366-890-11	SCREW (M1.4)	
153	1-663-392-11	MD FLEXIBLE BOARD	
154	3-338-645-31	WASHER (0.8-2.5)	
155	4-963-901-01	GEAR, WORM	
156	4-972-546-01	SPRING (WORM GEAR),COMPRESSION	
157	4-955-841-01	SCREW	

Ref. No.	Part No.	Description	Remark
158	4-963-898-01	GEAR (WORM WHEEL)	
159	X-4944-449-1	CHASSIS ASSY, GEAR	
160	4-964-564-01	SCREW (M1.2X1.6)	
161	1-651-017-11	CLV FLEXIBLE BOARD	
M901	1-698-542-11	MOTOR (SPINDLE)	
M903	A-3303-499-A	STEPPER BLOCK ASSY (STEPPING)	

SECTION 9
ELECTRICAL PARTS LIST

CONTROL **MAIN**

NOTE :
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- SEMICONDUCTORS
  In each case, u : μ , for example :
  uA.... : μ A.... , uPA.... : μ PA....
  uPB.... : μ PB.... , uPC.... : μ PC....
  uPD.... : μ PD....
- CAPACITORS
  uF : μ F
- COILS
  uH : μ H
- Abbreviation
  CND : Canadian
  AUS : Australian
  E13 : 220-230V AC area
  E33 : 100-240V AC area

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3293-256-A	CONTROL BOARD, COMPLETE			
		**********			
	1-651-017-11	CLV FLEXIBLE BOARD			
		< CAPACITOR >			
C701	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C702	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C703	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C704	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C705	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C706	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C707	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C710	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C711	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
		< CONNECTOR >			
CN701	1-691-356-21	CONNECTOR, FFC/FPC (ZIF) 18P			
CN702	1-691-370-11	CONNECTOR, FFC/FPC 6P			
		< IC >			
IC701	8-759-335-44	IC CXA8048N			
		< TRANSISTOR >			
Q703	8-729-427-83	TRANSISTOR XP6501			
		< RESISTOR >			
R701	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R702	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R703	1-216-815-11	METAL CHIP	330	5%	1/16W
R704	1-217-671-11	METAL CHIP	1	5%	1/10W
R705	1-217-671-11	METAL CHIP	1	5%	1/10W
R706	1-216-833-11	METAL CHIP	10K	5%	1/16W
R711	1-216-864-11	METAL CHIP	0	5%	1/16W

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S701	1-692-849-21	SWITCH, PUSH (1 KEY) (MEDIR)			
S702	1-692-847-21	SWITCH, PUSH (1 KEY) (PROTECT)			
S703	1-692-377-31	SWITCH, PUSH (1 KEY) (REFLECT)			
S704	1-572-467-41	SWITCH, PUSH (1 KEY) (INITIAL)			
S705	1-572-467-41	SWITCH, PUSH (1 KEY) (INLIMIT)			
**********					
	A-3293-312-A	MAIN BOARD, COMPLETE (E, Tourist)			
	A-3293-360-A	MAIN BOARD, COMPLETE (AEP, UK, AUS)			
	A-3293-361-A	MAIN BOARD, COMPLETE (US, CND)			
		**********			
		< CAPACITOR >			
C101	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C102	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C103	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C104	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C106	1-110-975-11	TANTAL. CHIP	47uF	20%	6.3V
C107	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C108	1-107-812-11	TANTAL. CHIP	4.7uF	20%	6.3V
C109	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C110	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C117	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C118	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C120	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C121	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C122	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C123	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C124	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C125	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C131	1-107-812-11	TANTAL. CHIP	4.7uF	20%	6.3V
C140	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C161	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C168	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C201	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V

MAIN

Ref. No.	Part No.	Description			Remark
C202	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C203	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C204	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C205	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C206	1-110-975-11	TANTAL. CHIP	47uF	20%	6.3V
C207	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C208	1-107-812-11	TANTAL. CHIP	4.7uF	20%	6.3V
C209	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C210	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C217	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C218	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C220	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C221	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C223	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C224	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C225	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C231	1-107-812-11	TANTAL. CHIP	4.7uF	20%	6.3V
C240	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C261	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C268	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C292	1-107-812-11	TANTAL. CHIP	4.7uF	20%	6.3V
C293	1-104-912-11	TANTALUM CHIP	3.3uF	20%	6.3V
C294	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C295	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C296	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C301	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C302	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C303	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C304	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C305	1-110-975-11	TANTAL. CHIP	47uF	20%	6.3V
C307	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C308	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C310	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C311	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C312	1-110-975-11	TANTAL. CHIP	47uF	20%	6.3V
C314	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C315	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C318	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C319	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C320	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C321	1-104-929-11	TANTAL. CHIP	22uF	20%	6.3V
C322	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C327	1-104-929-11	TANTAL. CHIP	22uF	20%	6.3V
C338	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C345	1-104-929-11	TANTAL. CHIP	22uF	20%	6.3V
C346	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C351	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C359	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C365	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C366	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C367	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (US,CND)

Ref. No.	Part No.	Description			Remark
C368	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C369	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C391	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (US,CND)
C392	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C393	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (US,CND)
C394	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V (US,CND)
C399	1-107-816-11	TANTAL. CHIP	0.68uF	20%	10V
C501	1-115-169-11	TANTALUM	10uF	20%	6.3V
C504	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C505	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C506	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C507	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C508	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C509	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C510	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C511	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C512	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C513	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C515	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C517	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C518	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C519	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C521	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C524	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C525	1-104-929-11	TANTAL. CHIP	22uF	20%	6.3V
C526	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C528	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C529	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C530	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C531	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C532	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C533	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C534	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C536	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C537	1-107-811-11	TANTAL. CHIP	47uF	20%	4V
C538	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C541	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C542	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C544	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C545	1-110-574-11	TANTAL. CHIP	22uF	20%	16V
C547	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C548	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C549	1-107-814-11	TANTAL. CHIP	33uF	20%	10V
C550	1-107-814-11	TANTAL. CHIP	33uF	20%	10V
C551	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C552	1-107-765-11	TANTAL. CHIP	3.3uF	20%	16V
C553	1-107-814-11	TANTAL. CHIP	33uF	20%	10V
C554	1-104-813-11	TANTAL. CHIP	10uF	20%	16V

Ref. No.	Part No.	Description			Remark
C555	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C556	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C557	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C558	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C559	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C560	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C561	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C562	1-110-574-11	TANTAL. CHIP	22uF	20%	16V
C563	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C564	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C565	1-135-180-21	TANTALUM CHIP	3.3uF	20%	10V
C566	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C567	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C568	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C569	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C570	1-107-814-11	TANTAL. CHIP	33uF	20%	10V
C571	1-104-630-11	TANTAL. CHIP	33uF	20%	6.3V
C572	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C575	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C576	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C577	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C578	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C714	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C715	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C716	1-107-813-11	TANTAL. CHIP	10uF	20%	6.3V
C811	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C812	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C813	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C814	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C815	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C816	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C817	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C818	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C819	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C820	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C821	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C822	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C824	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C825	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C826	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C827	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C828	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C829	1-135-337-11	TANTAL. CHIP	1uF	20%	6.3V
C830	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C831	1-110-574-11	TANTAL. CHIP	22uF	20%	16V
C833	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C834	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C835	1-164-315-11	CERAMIC CHIP	470PF	5%	50V
C836	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C851	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C861	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C862	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C901	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C904	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C905	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C908	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C910	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C913	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C914	1-135-213-21	TANTAL. CHIP	3.3uF	20%	25V
C3002	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V

< CONNECTOR >

CN501	1-691-386-11	CONNECTOR, FFC/FPC 22P
CN502	1-691-360-11	CONNECTOR, FFC/FPC (ZIF) 22P
CN903	1-691-362-11	CONNECTOR, FFC/FPC (ZIF) 24P
CN904	1-691-347-11	CONNECTOR, FFC/FPC (ZIF) 9P
CN905	1-691-351-11	CONNECTOR, FFC/FPC (ZIF) 13P

< DIODE >

D101	8-719-017-58	DIODE MA8068
D201	8-719-017-58	DIODE MA8068
D301	8-719-017-58	DIODE MA8068
D303	8-719-017-58	DIODE MA8068
D304	8-719-017-58	DIODE MA8068
D305	8-719-017-58	DIODE MA8068
D307	8-719-017-58	DIODE MA8068
D308	8-719-421-27	DIODE MA728
D310	8-719-017-58	DIODE MA8068
D501	8-719-421-27	DIODE MA728
D502	8-719-421-27	DIODE MA728
D503	8-719-049-09	DIODE 1SS367-T3SONY
D504	8-719-049-09	DIODE 1SS367-T3SONY
D803	8-719-052-72	LED CL-220HR-C (REC)
D804	8-719-421-27	DIODE MA728
D805	8-719-421-27	DIODE MA728
D806	8-719-421-27	DIODE MA728
D807	8-719-421-27	DIODE MA728
D808	8-719-047-73	DIODE HRU0302A-TR
D809	8-719-421-27	DIODE MA728
D902	8-719-404-49	DIODE MA111
D903	8-719-977-03	DIODE DTZ5.6B
D905	8-719-975-33	DIODE RB110C
D906	8-719-421-27	DIODE MA728
D907	8-719-975-33	DIODE RB110C
D3001	8-719-421-27	DIODE MA728

< FERRITE BEAD >

FB309	1-256-864-11	METAL CHIP	0	5%	1/16W (EXCEPT US, CND)
FB309	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
FB350	1-414-228-11	INDUCTOR, FERRITE BEAD			
FB501	1-414-385-11	INDUCTOR, FERRITE BEAD			

MAIN

Ref. No.	Part No.	Description	Remark
FB502	1-216-864-11	METAL CHIP 0 5% 1/16W	(E, Tourist)
FB502	1-414-385-11	INDUCTOR, FERRITE BEAD (EXCEPT E, Tourist)	
FB503	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT US, CND)
FB503	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)	
FB504	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT US, CND)
FB504	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)	
FB505	1-216-864-11	METAL CHIP 0 5% 1/16W	(EXCEPT US, CND)
FB505	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)	
		< IC >	
IC301	8-759-337-18	IC TK11225AMTL	
IC302	8-759-252-90	IC TLV2362IPW-ELM1500	
IC303	8-759-439-74	IC AK4515-VQ	
IC304	8-759-252-90	IC TLV2362IPW-ELM1500	
IC306	8-759-173-00	IC XC61AN1102MR	
IC352	8-759-332-22	IC DS1802E-TE2	
IC501	8-752-074-77	IC CXA2523R	
IC502	8-759-234-20	IC TC7S08F-TE85L	
IC503	8-752-384-46	IC CXD2652R	
IC504	8-759-432-73	IC XC62SPR212MR	
IC505	8-759-442-80	IC MPC17A38ZVMEL	
IC506	8-759-329-43	IC MPC18A20VMEL	
IC508	8-759-710-79	IC NJM2107F-TE1	
IC509	8-759-341-28	IC HM51W4400BTT-7	
IC510	8-759-333-42	IC XC61AN3002MR	
IC702	8-759-329-45	IC MPC17A33SVMEL	
IC801	8-752-878-84	IC CXP81960M-632R	
IC802	8-759-343-90	IC RS5RJ29261-T1	
IC803	8-759-332-25	IC XC31PNS01AMR	
IC804	8-759-343-88	IC DS1302Z-TE2	
IC805	8-759-458-97	IC LA4800V-TLM	
IC807	8-759-425-16	IC AK93C45LV-L	
IC909	8-759-427-91	IC MM1332DFBE	
		< JACK >	
J301	1-764-460-11	JACK (MIC,PLUG IN POWER)	
J302	1-778-368-11	JACK, HEADPHONE (Ω)/REMOTE)	
J303	1-764-460-21	JACK (LINE OUT)	
J304	8-759-252-45	IC GP1F365R (LINE IN,OPTICAL)	
J901	1-568-907-11	JACK,DC(POLARITY UNIFIED TYPE) (DC IN 6V)	
		< COIL >	
L303	1-414-398-11	INDUCTOR 10uH	
L304	1-414-410-21	INDUCTOR 10uH	
L501	1-414-398-11	INDUCTOR 10uH	
L502	1-414-398-11	INDUCTOR 10uH	
L504	1-414-410-21	INDUCTOR 10uH	
L505	1-412-034-11	INDUCTOR CHIP 330uH	
L506	1-414-402-11	INDUCTOR 47uH	
L507	1-414-402-11	INDUCTOR 47uH	
L508	1-414-402-11	INDUCTOR 47uH	
L509	1-414-402-11	INDUCTOR 47uH	
L510	1-414-410-21	INDUCTOR 10uH	
L511	1-414-402-11	INDUCTOR 47uH	
L512	1-411-322-21	COIL, CHOKE 68.0uH	
L513	1-414-398-11	INDUCTOR 10uH	
L514	1-412-034-11	INDUCTOR CHIP 330uH	
L801	1-414-402-11	INDUCTOR 47uH	
		< LINE FILTER >	
LF901	1-411-312-11	FILTER, COMMON MODE	
		< TRANSISTOR >	
Q101	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q102	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q201	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q202	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q301	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q302	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q305	8-729-023-89	TRANSISTOR 2SJ305(TE85L)	
Q309	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q311	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q312	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q313	8-729-929-99	TRANSISTOR UMB11-TN	
Q314	8-729-929-99	TRANSISTOR UMB11-TN	
Q318	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q320	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q502	8-729-422-39	TRANSISTOR XN4404	
Q503	8-729-930-13	TRANSISTOR UMH2	
Q504	8-729-019-25	TRANSISTOR 2SK1467-TD	
Q505	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q506	8-729-023-89	TRANSISTOR 2SJ305(TE85L)	
Q701	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q702	8-729-904-07	TRANSISTOR FMG2	
Q801	8-729-028-91	TRANSISTOR DTA144EUA-T106	
Q806	8-729-031-34	TRANSISTOR 2SK2034	
Q810	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q811	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q812	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
Q901	8-729-907-00	TRANSISTOR DTC114EU	
Q902	8-729-120-53	TRANSISTOR 2SJ132-Z	
Q903	8-729-029-14	TRANSISTOR DTC144EUA-T106	
Q904	8-729-921-93	TRANSISTOR 2SB1182F5-QR	
Q907	8-729-028-99	TRANSISTOR DTC114YUA-T106	
Q910	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L	
		< RESISTOR >	
R101	1-218-867-11	METAL CHIP 6.8K 0.50% 1/16W	
R102	1-218-887-11	METAL CHIP 47K 0.50% 1/16W	
R103	1-218-867-11	METAL CHIP 6.8K 0.50% 1/16W	
R104	1-218-887-11	METAL CHIP 47K 0.50% 1/16W	

Ref. No.	Part No.	Description			Remark
R105	1-216-837-11	METAL CHIP	22K	5%	1/16W
R107	1-218-883-11	METAL CHIP	33K	0.50%	1/16W
R108	1-218-843-11	METAL CHIP	680	0.50%	1/16W
R111	1-218-891-11	METAL CHIP	68K	0.50%	1/16W
R112	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R119	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R121	1-218-891-11	METAL CHIP	68K	0.50%	1/16W
R122	1-218-875-11	METAL CHIP	15K	0.50%	1/16W
R123	1-218-855-11	METAL CHIP	2.2K	0.50%	1/16W
R124	1-218-875-11	METAL CHIP	15K	0.50%	1/16W
R134	1-218-847-11	METAL CHIP	1K	0.50%	1/16W
R136	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R137	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R139	1-216-813-11	METAL CHIP	220	5%	1/16W
R140	1-216-813-11	METAL CHIP	220	5%	1/16W
R141	1-216-833-11	METAL CHIP	10K	5%	1/16W
R144	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)
R144	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R145	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R146	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R159	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)
R159	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R160	1-216-857-11	METAL CHIP	1M	5%	1/16W
R201	1-218-867-11	METAL CHIP	6.8K	0.50%	1/16W
R202	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R203	1-218-867-11	METAL CHIP	6.8K	0.50%	1/16W
R204	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R205	1-216-837-11	METAL CHIP	22K	5%	1/16W
R207	1-218-883-11	METAL CHIP	33K	0.50%	1/16W
R208	1-218-843-11	METAL CHIP	680	0.50%	1/16W
R211	1-218-891-11	METAL CHIP	68K	0.50%	1/16W
R212	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R219	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R221	1-218-891-11	METAL CHIP	68K	0.50%	1/16W
R222	1-218-875-11	METAL CHIP	15K	0.50%	1/16W
R223	1-218-855-11	METAL CHIP	2.2K	0.50%	1/16W
R224	1-218-875-11	METAL CHIP	15K	0.50%	1/16W
R234	1-218-847-11	METAL CHIP	1K	0.50%	1/16W
R236	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R237	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R239	1-216-813-11	METAL CHIP	220	5%	1/16W
R240	1-216-813-11	METAL CHIP	220	5%	1/16W
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W
R244	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)
R244	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R245	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R246	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R259	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)

Ref. No.	Part No.	Description			Remark
R259	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R260	1-216-857-11	METAL CHIP	1M	5%	1/16W
R301	1-216-833-11	METAL CHIP	10K	5%	1/16W
R302	1-216-833-11	METAL CHIP	10K	5%	1/16W
R303	1-216-857-11	METAL CHIP	1M	5%	1/16W
R306	1-216-150-91	METAL GLAZE	10	5%	1/8W
R307	1-216-809-11	METAL CHIP	100	5%	1/16W
R308	1-216-809-11	METAL CHIP	100	5%	1/16W
R309	1-216-809-11	METAL CHIP	100	5%	1/16W
R346	1-216-857-11	METAL CHIP	1M	5%	1/16W
R347	1-216-857-11	METAL CHIP	1M	5%	1/16W
R352	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)
R352	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R355	1-216-847-11	METAL CHIP	150K	5%	1/16W
R359	1-216-864-11	METAL CHIP	0	5%	1/16W
					(EXCEPT US, CND)
R359	1-414-385-11	INDUCTOR, FERRITE BEAD (US, CND)			
R361	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R364	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R365	1-216-809-11	METAL CHIP	100	5%	1/16W
R367	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R368	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R374	1-216-845-11	METAL CHIP	100K	5%	1/16W
R380	1-216-864-11	METAL CHIP	0	5%	1/16W
R381	1-216-809-11	METAL CHIP	100	5%	1/16W
R398	1-216-839-11	METAL CHIP	33K	5%	1/16W
R399	1-216-839-11	METAL CHIP	33K	5%	1/16W
R501	1-216-835-11	METAL CHIP	15K	5%	1/16W
R502	1-216-835-11	METAL CHIP	15K	5%	1/16W
R503	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R504	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W
R505	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R506	1-216-811-11	METAL CHIP	150	5%	1/16W
R507	1-216-833-11	METAL CHIP	10K	5%	1/16W
R508	1-216-817-11	METAL CHIP	470	5%	1/16W
R509	1-216-853-11	METAL CHIP	470K	5%	1/16W
R510	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R511	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R512	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R513	1-216-843-11	METAL CHIP	68K	5%	1/16W
R514	1-216-864-11	METAL CHIP	0	5%	1/16W
R515	1-216-864-11	METAL CHIP	0	5%	1/16W
R516	1-216-821-11	METAL CHIP	1K	5%	1/16W
R517	1-216-162-00	METAL GLAZE	33	5%	1/8W
R519	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R520	1-216-841-11	METAL CHIP	47K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-845-11	METAL CHIP	100K	5%	1/16W
R526	1-216-853-11	METAL CHIP	470K	5%	1/16W
R527	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R528	1-216-821-11	METAL CHIP	1K	5%	1/16W

MAIN

Ref. No.	Part No.	Description			Remark
R529	1-216-821-11	METAL CHIP	1K	5%	1/16W
R530	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R531	1-216-845-11	METAL CHIP	100K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-839-11	METAL CHIP	33K	5%	1/16W
R534	1-216-839-11	METAL CHIP	33K	5%	1/16W
R535	1-216-843-11	METAL CHIP	68K	5%	1/16W
R536	1-218-891-11	METAL CHIP	68K	0.50%	1/16W
R537	1-218-899-11	METAL CHIP	150K	0.50%	1/16W
R538	1-218-895-11	METAL CHIP	100K	0.50%	1/16W
R539	1-216-833-11	METAL CHIP	10K	5%	1/16W
R540	1-216-857-11	METAL CHIP	1M	5%	1/16W
R541	1-216-843-11	METAL CHIP	68K	5%	1/16W
R542	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R543	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R544	1-216-843-11	METAL CHIP	68K	5%	1/16W
R545	1-216-845-11	METAL CHIP	100K	5%	1/16W
R546	1-216-841-11	METAL CHIP	47K	5%	1/16W
R549	1-216-845-11	METAL CHIP	100K	5%	1/16W
R554	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R555	1-216-817-11	METAL CHIP	470	5%	1/16W
R556	1-216-864-11	METAL CHIP	0	5%	1/16W
R559	1-216-811-11	METAL CHIP	150	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R562	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W
R564	1-216-843-11	METAL CHIP	68K	5%	1/16W
R565	1-216-845-11	METAL CHIP	100K	5%	1/16W
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W
R571	1-216-817-11	METAL CHIP	470	5%	1/16W (US, CND)
R571	1-216-864-11	METAL CHIP	0	5%	1/16W (EXCEPT US, CND)
R572	1-216-817-11	METAL CHIP	470	5%	1/16W (US, CND)
R572	1-216-864-11	METAL CHIP	0	5%	1/16W (EXCEPT US, CND)
R576	1-216-813-11	METAL CHIP	220	5%	1/16W (EXCEPT US, CND)
R576	1-216-817-11	METAL CHIP	470	5%	1/16W (US, CND)
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W
R709	1-216-845-11	METAL CHIP	100K	5%	1/16W
R710	1-216-819-11	METAL CHIP	680	5%	1/16W
R802	1-216-851-11	METAL CHIP	330K	5%	1/16W
R803	1-216-857-11	METAL CHIP	1M	5%	1/16W
R806	1-216-857-11	METAL CHIP	1M	5%	1/16W
R807	1-216-857-11	METAL CHIP	1M	5%	1/16W
R813	1-216-809-11	METAL CHIP	100	5%	1/16W
R816	1-216-851-11	METAL CHIP	330K	5%	1/16W
R817	1-216-851-11	METAL CHIP	330K	5%	1/16W
R818	1-216-857-11	METAL CHIP	1M	5%	1/16W
R819	1-218-895-11	METAL CHIP	100K	0.50%	1/16W
R820	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R821	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R822	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R823	1-218-895-11	METAL CHIP	100K	0.50%	1/16W
R826	1-216-864-11	METAL CHIP	0	5%	1/16W
R827	1-216-864-11	METAL CHIP	0	5%	1/16W
R828	1-216-853-11	METAL CHIP	470K	5%	1/16W
R829	1-216-847-11	METAL CHIP	150K	5%	1/16W
R830	1-216-851-11	METAL CHIP	330K	5%	1/16W
R831	1-216-853-11	METAL CHIP	470K	5%	1/16W
R832	1-216-851-11	METAL CHIP	330K	5%	1/16W
R833	1-216-857-11	METAL CHIP	1M	5%	1/16W
R834	1-216-857-11	METAL CHIP	1M	5%	1/16W
R835	1-216-845-11	METAL CHIP	100K	5%	1/16W
R836	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R837	1-216-851-11	METAL CHIP	330K	5%	1/16W
R838	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R839	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R840	1-218-879-11	METAL CHIP	22K	0.50%	1/16W
R841	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R847	1-216-845-11	METAL CHIP	100K	5%	1/16W
R852	1-218-883-11	METAL CHIP	33K	0.50%	1/16W
R853	1-216-809-11	METAL CHIP	100	5%	1/16W
R854	1-216-857-11	METAL CHIP	1M	5%	1/16W
R855	1-216-851-11	METAL CHIP	330K	5%	1/16W
R856	1-216-821-11	METAL CHIP	1K	5%	1/16W
R857	1-216-833-11	METAL CHIP	10K	5%	1/16W
R861	1-216-857-11	METAL CHIP	1M	5%	1/16W
R862	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R863	1-216-857-11	METAL CHIP	1M	5%	1/16W
R864	1-216-857-11	METAL CHIP	1M	5%	1/16W
R865	1-216-809-11	METAL CHIP	100	5%	1/16W
R866	1-216-851-11	METAL CHIP	330K	5%	1/16W
R867	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R868	1-216-845-11	METAL CHIP	100K	5%	1/16W
R869	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R870	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R871	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R872	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R873	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R874	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R876	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R877	1-216-845-11	METAL CHIP	100K	5%	1/16W
R878	1-216-833-11	METAL CHIP	10K	5%	1/16W
R901	1-216-817-11	METAL CHIP	470	5%	1/16W
R902	1-216-833-11	METAL CHIP	10K	5%	1/16W
R905	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R910	1-216-853-11	METAL CHIP	470K	5%	1/16W
R911	1-216-845-11	METAL CHIP	100K	5%	1/16W
R970	1-216-853-11	METAL CHIP	470K	5%	1/16W
R972	1-208-293-11	METAL GLAZE	0.47	10%	1/10W

Ref. No.	Part No.	Description			Remark
R975	1-208-293-11	METAL GLAZE	0.47	10%	1/10W
R3001	1-216-837-11	METAL CHIP	22K	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
RB535	1-239-436-11	NETWORK RESISTOR (CHIP) 33K			
RB801	1-233-703-21	NETWORK RESISTOR (CHIP) 1M			
RB802	1-239-446-11	NETWORK RESISTOR (CHIP) 330K			
		< SWITCH >			
S301	1-762-078-11	SWITCH, SLIDE (MIC SENS)			
S808	1-572-467-41	SWITCH, PUSH (1 KEY) (◄—REC)			
S809	1-572-473-11	SWITCH, TACTIL (CLOCK SET)			
S810	1-572-499-21	SWITCH, TACTIL (DIGITAL MEGA BASS)			
S811	1-762-078-11	SWITCH, SLIDE (AVLS)			
S816	1-762-078-11	SWITCH, SLIDE (SYNCHRO REC)			
S817	1-762-805-21	SWITCH, PUSH (DOOR OPEN/CLOSE)			
S818	1-762-078-11	SWITCH, SLIDE (◄—HOLD)			
S823	1-572-467-41	SWITCH, PUSH (1 KEY) (◄—OPEN)			
		< THERMISTOR >			
⚠THP901	1-810-792-11	SWITCH, POLYETHYLENE			
		< VIBRATOR >			
X501	1-760-173-11	VIBRATOR, CRYSTAL (45.158MHz)			
X801	1-760-174-11	VIBRATOR, CERAMIC (12MHz)			
X802	1-579-886-21	VIBRATOR, CRYSTAL (32.768kHz)			
**********					
	A-3293-253-A	POWER BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C801	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C802	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C803	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C804	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C805	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C807	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C809	1-115-169-11	TANTALUM	10uF	20%	6.3V
C810	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C832	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C837	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C840	1-126-923-11	ELECT	220uF	20%	10V
C841	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C842	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C843	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C860	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C863	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C899	1-251-470-11	ELEMENT,	STORAGE		
		< CONNECTOR >			
CN805	1-691-362-11	CONNECTOR, FFC/FPC (ZIF) 24P			

Ref. No.	Part No.	Description			Remark
		< DIODE >			
D801	8-719-975-33	DIODE RB110C			
D802	8-719-975-33	DIODE RB110C			
D810	8-719-975-54	DIODE HSM2838C			
D812	8-719-975-33	DIODE RB110C			
		< IC >			
IC806	8-759-331-73	IC MB3800PNF			
IC808	8-729-039-08	IC TRANSISTOR SI6946DQ-T1			
IC809	8-729-039-07	IC TRANSISTOR SI6943DQ-T1			
IC810	8-759-358-71	IC S-80719SL-AG-T1			
		< COIL >			
L802	1-411-803-21	COIL, CHOKE	33uH		
L804	1-414-410-21	INDUCTOR	10uH		
L805	1-414-410-21	INDUCTOR	10uH		
		< TRANSISTOR >			
Q802	8-729-031-34	TRANSISTOR 2SK2034			
Q803	8-729-031-31	TRANSISTOR 2SD2402			
Q804	8-729-822-62	TRANSISTOR 2SB1302-T			
Q805	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q807	8-729-029-14	TRANSISTOR DTC144EUA-T106			
Q808	8-729-019-25	TRANSISTOR 2SK1467-TD			
Q813	8-729-028-91	TRANSISTOR DTA144EUA-T106			
Q814	8-729-029-14	TRANSISTOR DTC144EUA-T106			
Q815	8-729-019-25	TRANSISTOR 2SK1467-TD			
		< RESISTOR >			
R801	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R804	1-218-895-11	METAL CHIP	100K	0.5%	1/16W
R805	1-218-895-11	METAL CHIP	100K	0.5%	1/16W
R808	1-216-817-11	METAL CHIP	470	5%	1/16W
R809	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R810	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R811	1-216-821-11	METAL CHIP	1K	5%	1/16W
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R814	1-218-883-11	METAL CHIP	33K	0.5%	1/16W
R815	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R824	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R825	1-216-857-11	METAL CHIP	1M	5%	1/16W
R846	1-218-875-11	METAL CHIP	15K	0.5%	1/16W
R875	1-216-801-11	METAL CHIP	22	5%	1/16W
R879	1-216-821-11	METAL CHIP	1K	5%	1/16W
R880	1-216-837-11	METAL CHIP	22K	5%	1/16W
R898	1-216-857-11	METAL CHIP	1M	5%	1/16W
		< VARIABLE RESISTOR >			
RV801	1-238-663-11	RES, ADJ, CARBON 4.7K (2.8V ADJUST)			
**********					

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REC SWITCH

Ref. No.	Part No.	Description			Remark
*	1-663-390-11	REC BOARD			
		**********			
		< CAPACITOR >			
C401	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C402	1-107-810-11	TANTAL. CHIP	33uF	20%	4V
C403	1-109-814-11	MICA CHIP	220PF	5%	100V
		< CONNECTOR >			
CN401	1-691-344-11	CONNECTOR, FFC/FPC (ZIF) 6P			
CN402	1-691-344-11	CONNECTOR, FFC/FPC (ZIF) 6P			
		< DIODE >			
D401	8-719-046-86	DIODE F1J6TP			
D402	8-719-046-86	DIODE F1J6TP			
		< TRANSISTOR >			
Q401	8-729-024-44	TRANSISTOR 2SK2315TYTR			
Q402	8-729-024-44	TRANSISTOR 2SK2315TYTR			
Q403	8-729-024-44	TRANSISTOR 2SK2315TYTR			
Q404	8-729-024-44	TRANSISTOR 2SK2315TYTR			
**********					
	A-3306-147-A	SWITCH BOARD, COMPLETE			
		**********			
		< RESISTOR >			
R844	1-218-867-11	METAL CHIP	6.8K	0.50%	1/16W
R845	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
		< SWITCH >			
S804	1-762-851-21	SWITCH, KEY BOARD (VOLUME –)			
S805	1-762-851-21	SWITCH, KEY BOARD (VOLUME +)			
S806	1-762-851-21	SWITCH, KEY BOARD (■■)			
**********					
		MISCELLANEOUS			
		**********			
13	1-801-522-11	LCD MODULE			
51	1-473-895-11	SWITCH UNIT (WITH JOG DIAL)			
74	1-777-761-11	WIRE (FLAT TYPE) (24 CORE)			
106	1-651-018-11	SLED FLEXIBLE BOARD			
⚠121	A-3311-140-A	OPTICAL PICK-UP ASSY			
153	1-663-392-11	MD FLEXIBLE BOARD			
161	1-651-017-11	CLV FLEXIBLE BOARD			
M901	1-698-542-11	MOTOR (SPINDLE)			
M902	A-3303-502-A	MOTOR BLOCK ASSY (SLED)			
M903	A-3303-499-A	STEPPER BLOCK ASSY (STEPPING)			
**********					

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠	1-467-510-31	ADAPTOR, AC (AC-MZ60A) (US, CND)	
⚠	1-467-511-31	ADAPTOR, AC (AC-MZ60A) (AEP)	
⚠	1-467-511-41	ADAPTOR, AC (AC-MZ60) (E13)	
⚠	1-467-513-21	ADAPTOR, AC (AC-MZ60) (UK, AUS)	
⚠	1-467-514-11	ADAPTOR, AC (AC-MZ60) (E33, Tourist)	
	1-473-109-31	REMOTE CONTROL UNIT	
	1-559-906-32	CORD, CONNECTION (AEP, UK)	
⚠	1-569-007-11	ADAPTOR, CONVERSION 2P (E33, Tourist)	
	1-759-277-21	CASE, BATTERY (EBP-MZR4)	
	1-779-504-11	CONNECTOR, OPTICAL (E13)	
	3-858-529-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH, GERMAN,SPANISH) (CND, AEP, E33, Tourist)	
	3-858-529-21	MANUAL, INSTRUCTION (ENGLISH) (US, UK, AUS, E13)	
	3-858-529-31	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN, PORTUGUESE) (AEP)	
	3-858-529-41	MANUAL, INSTRUCTION (JAPANESE,KOREAN, CHINESE) (E13, Tourist)	
	4-973-528-01	CASE, CARRYING	
*	4-987-395-01	CASE, INDIVIDUAL (EXCEPT US)	
*	4-991-504-01	CASE, INDIVIDUAL (US)	
	8-953-091-90	HEADPHONE MDR-E838MP SET (EXCEPT US)	
	8-953-101-90	HEADPHONE MDR-24MP SET (US)	
	X-3329-657-1	ATTACHMENT ASSY (EXCEPT US)	

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